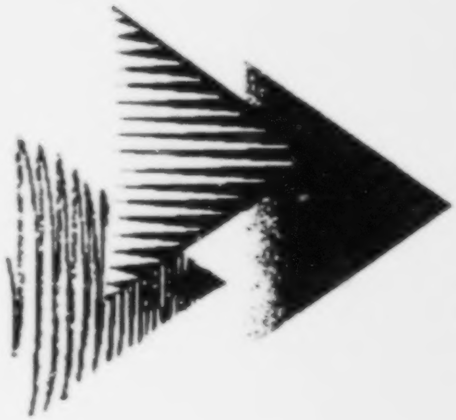

# CAREER & TECHNOLOGY STUDIES

# MANUAL FOR ADMINISTRATORS, COUNSELLORS AND TEACHERS

JUNE 1998

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Questions or comments about this document are welcomed and should be directed to the Program Manager, Career and Technology Studies Unit, Curriculum Standards Branch.

The primary intended audience for this document is:

| | |
|---|---|
| *Administrators* | ✓ |
| *Counsellors* | ✓ |
| *General Audience* | |
| *Parent School Councils* | |
| *Parents* | |
| *Students* | |
| *Teachers* | ✓ |

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# PREFACE

This manual is also available for viewing and downloading from the Alberta Education web site at:

<http://ednet.edc.gov.ab.ca>
under "Students and Learning," then "Student Programs."

***Note**: Check memory capacity on your computer before downloading CTS documents.*

In addition to reviewing draft documents and providing input during curriculum development, many of the 2400 (January 1995) members of the CTS Communication Network asked questions and provided suggestions about matters related to the implementation of CTS that affect teachers, counsellors and administrators. We have tried to address these within this manual.

This manual includes information and recommendations related to:

- understanding the CTS program
- planning CTS programs in schools and school systems
- implementing CTS courses in the classroom.

Also included in this manual are charts, forms and a series of appendices that provide additional information and guidelines relevant to implementing CTS, and blackline masters for program administration.

This manual is a useful reference for those having the responsibility for planning and implementing CTS at the school system, school and classroom levels.

**Note**:

- The CTS "modules" are now officially referred to as "courses" each with an individual, alphanumeric code. In this manual, the term "course" refers to a 1-credit CTS course, and the term "cluster" refers to a multiple-credit CTS offering.
- In accordance with the change to the terminology from "module" to "course," there is a subsequent change in references to the "learner expectations." In this manual, and in future *Guides to Standards and Implementation*, "module learner expectations" are referred to as "general outcomes" and "specific learner expectations" are referred to as "specific outcomes."
- This manual is a support document that supplements other CTS documents, including the *Career and Technology Studies Program of Studies* and the *Guide to Standards and Implementation* for each strand. The *Guide to Education: ECS to Grade 12* and the *Career and Technology Studies Program of Studies* define the legal or prescriptive components of CTS.
- This manual may not answer all of your questions. You may wish to refer to the current issue of the *Guide to Education: ECS to Grade 12* for further information regarding policies and guidelines.

For additional information about CTS and specific program planning, contact:

Career and Technology Studies Unit, Curriculum Standards Branch, Alberta Education
Devonian Building, East Tower, 11160 Jasper Avenue, Edmonton, Alberta, Canada, T5K 0L2
Telephone: 403–422–4872, Fax: 403–422–0576
Toll Free Inside Alberta 310–0000.

# Send Us Your Comments

We would appreciate receiving your comments about this manual. We would especially like to know:

Do you feel there are any topics requiring additional information or clarification?

Do you feel there are any topics that should be deleted?

Are there any questions or issues that you feel need to be addressed?

Additional Comments

Please return completed form to the Career and Technology Studies Unit, Curriculum Standards Branch, Alberta Education, Devonian Building, East Tower, 11160 Jasper Avenue, Edmonton, Alberta, Canada, T5K 0L2. Telephone: 403–422–4872; Fax: 403–422–0576. Toll Free Inside Alberta 310–0000.

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## WHAT IS CTS?

Refer to the *CTS Guide to Standards and Implementation*, Section A: Program Rationale and Philosophy.

CTS is an optional program designed for Alberta's secondary school students. As a program of choice, CTS helps junior and senior high school students to:

- develop skills they can apply in daily living now and in the future
- investigate career options and make effective career choices
- use technology (processes, tools and techniques) effectively and efficiently
- apply and reinforce learnings developed in other subject areas
- prepare for entry into the workplace or further learning.

The 1-credit course structure of CTS enables schools to design unique clusters of courses that meet the needs of students and take advantage of community resources. Developed across levels rather than grades, CTS has multiple entry points and provides junior and senior high school students with access to a common curriculum. As a competency-based curriculum, CTS recognizes prior learning from formal schooling and personal initiatives.

The CTS curriculum is organized into strands and courses as outlined in the following chart. Each strand represents a group of courses designed to support broad career and occupational opportunities. Courses are the building blocks for each strand, and defines what a student is expected to know and be able to do.

| CTS Strands | Number of Courses |
|---|---|
| Agriculture | 33 |
| Career Transitions | 28 |
| Communication Technology | 33 |
| Community Health | 31 |
| Construction Technologies | 46 |
| Cosmetology Studies | 58 |
| Design Studies | 31 |
| Electro-Technologies | 37 |
| Energy and Mines | 26 |
| Enterprise and Innovation | 8 |
| Fabrication Studies | 41 |
| Fashion Studies | 29 |
| Financial Management | 14 |
| Foods | 37 |
| Forestry | 21 |
| Information Processing | 48 |
| Legal Studies | 13 |
| Logistics | 12 |
| Management and Marketing | 19 |
| Mechanics | 54 |
| Tourism Studies | 24 |
| Wildlife | 17 |

## WHO IS AFFECTED BY CTS?

CTS was developed to accommodate the varied experiences and needs of all learners in Alberta's junior and senior high schools. Effective September 1997, the CTS program replaced the former practical arts program, including courses in business education, home economics, industrial arts and vocational education. A list of CTS strands and the former practical arts courses they replace is provided at the end of this section in Chart 1: CTS Strands Replacing Practical Arts Courses.

Refer to the *Guide to Education: ECS to Grade 12.*

CTS is part of the junior and senior high school optional course selection, and is therefore a program of choice for junior and senior high school students. Junior high school students can access up to 450 hours of instruction in CTS throughout their junior high school years. The CTS competencies that students develop while in junior high can form an important foundation for further learning at the high school level. Senior high school students may choose to register in CTS courses to meet optional course requirements for the Alberta High School Diploma. Based on current enrollment patterns, about 75 per cent of Alberta's students will earn at least 30 high school credits in CTS.

## HOW WAS CTS DEVELOPED?

Development of the CTS program was based on a review of all the former practical arts programs. Through an extensive consultation process, key interest groups were asked to identify elements of these programs that should continue as well as changes that should be made. Former practical arts programs were analyzed in terms of learning environments, enrollment patterns and delivery methods.

Refer to:
- *A Status Report on the Practical Arts Programs Within Secondary Schools in Alberta*, 1989
- *Trends and Issues Affecting Practical Arts in Alberta Secondary Schools: A Review of Research*, 1989
- *Framework for Change: Career and Technology Studies in Secondary Schools in Alberta*, 1990.

In addition, research was conducted to identify:

- trends and issues affecting specific practical arts programs and secondary education in general
- promising practices that could serve as models for curriculum development and implementation.

Based on the results of this consultation and research, a framework for the CTS program was established that included guiding principles and a structure for curriculum development.

The development process included extensive consultation with key interest groups relevant to each strand; i.e., teachers, schools and school systems, post-secondary institutions, business and industry, other government departments. Throughout the development period, over 2400 Albertans were involved in developing and validating the 22 CTS strands. The consultation process used throughout the development of CTS is illustrated at the end of this section in Chart 2: CTS Advisory and Consultation Network.

## WHY WAS CTS DEVELOPED?

Refer to the *CTS Guide to Standards and Implementation,* Section A: Program Rationale and Philosophy.

The CTS curriculum was developed to enhance the **relevance** and **credibility** of existing optional programs, and to expand **access** to these programs for all junior and senior high school students.

CTS consolidates and expands upon learnings in the former practical arts courses, and enables educators to respond effectively to rapid changes in our society, including:

- a renewed emphasis in the workplace on teamwork, creativity, problem solving and flexibility
- advances in technology
- the growing demand for multiskilled workers
- the move toward a global economy
- growth in trades, technical and service occupations.

The CTS program responds to the need for students to develop technology-related skills and begin serious exploration of their career options. Program objectives were established jointly by Alberta Education, school system administrators and teachers, and other stakeholder groups, and focus attention on:

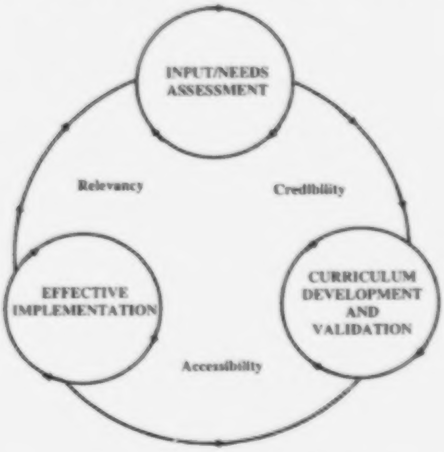
- integrating basic competencies—employability skills—and technology outcomes into a results-based curriculum, thus enhancing transitions for students into the workplace and related post-secondary programs
- establishing credible and clearly-defined standards for measuring student performance and achievement
- making connections with curriculum in other core and optional courses
- establishing flexible delivery strategies, including workplace learning and community partnerships, that make efficient use of in-school and community resources
- improving linkages among educators, business and industry, post-secondary institutions, community agencies and Alberta Education.

## HOW IS CTS MAINTAINED?

Strategies are in place for evergreening CTS. Key goals of the evergreening process are to:

- maintain a relevant and credible curriculum and resource base
- support the effective implementation of CTS programs.

**STRATEGY FOR "EVERGREENING CTS"**



Annual strategies for maintaining a relevant and credible curriculum and resource base include:

- gathering input from key players regarding strengths and gaps in curriculum and resources
- establishing priorities for change based on future gazing and the feedback received
- revising curriculum and assessment standards, drafting new courses and identifying new resources, as required
- validating new or revised curriculum and resources for subsequent approval and implementation.

Effective implementation of CTS is supported by a number of ongoing initiatives that focus attention on:

- support for teachers through curriculum and resources, key contacts, professional development
- effective use of learning/teaching resources, facilities/equipment, learning time and other resources
- expanded delivery options for CTS strands/courses; e.g., distance delivery, linkages with core, off-campus learning
- smooth transitions for CTS students from junior to senior high and from senior high to post-secondary and the workplace
- ongoing exchange of information with teachers, schools and school systems through the *Career and Technology Studies Manual for Administrators, Counsellors and Teachers*, *CTS Communication Network Update*, CTS web site and other documents.

Ongoing input from teachers and other stakeholders across the province is essential to an effective evergreening process. Feedback regarding CTS curriculum, resources and implementation strategies can be provided using Form 1: Evergreening CTS—Survey and Response Form, which is included at the end of this section.

**Note 1**: The CTS "modules" are now officially referred to as "courses" each with an individual, alphanumeric code. In this manual, the term "course" refers to a 1-credit CTS course, and the term "cluster" refers to a multiple-credit CTS offering.

**Note 2**: In accordance with the change to the terminology from "module" to "course," there is a subsequent change in references to the "learner expectations." In this manual, and in future *Guides to Standards and Implementation*, "module learner expectations" are referred to as "general outcomes" and "specific learner expectations" are referred to as "specific outcomes."

## PUTTING THE PARTS TOGETHER

### Strands and Courses

Refer to the *CTS Guide to Standards and Implementation*, Section B: Strand Rationale and Philosophy.

There are 22 strands in CTS. Each strand is comprised of a group of courses designed to support positive career and occupational opportunities for students. In general, strands relate to selected industry sectors, including goods-producing industries such as agriculture, manufacturing and construction, and service-producing industries such as business, health and finance. Learnings within any particular strand may involve similar tools and technologies, clientele, working environments, products and processes.

There are 660 courses in CTS. Courses are the building blocks for each strand. A course defines what the student is expected to know and be able to do, and describes the conditions and criteria by which a student's performance can be judged. Although courses are designed to take approximately 17 to 25 hours of study, some students may need less or more time to complete a course. Courses are organized into levels, not grades. Both junior and senior high school students can access CTS courses. Where appropriate, prerequisites and other requirements for course delivery are specified.

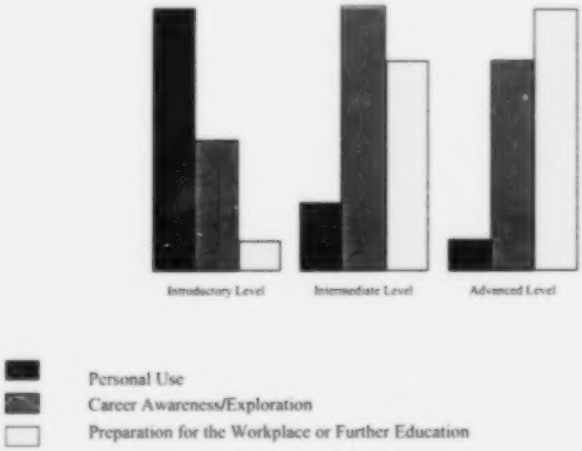
### Levels of Achievement

The CTS program is level based, not grade based, and thus can be started by students at different entry points. Courses in each strand are organized into three levels:

- **introductory** level courses help students build daily living skills and form the basis for further learning. Introductory courses are for students who have no previous experience in the strand
- **intermediate** level courses build on the competencies developed at the introductory level. They provide a broader perspective, helping students recognize the wide range of related career opportunities available within the strand
- **advanced** level courses refine expertise and help prepare students for entry into the workplace or a related post-secondary program.

As junior and senior high school students progress through the levels, they are expected to meet higher standards and demonstrate an increasing degree of competence, both in the scope of learning and quality of performance.

The following illustrates the relative emphasis on aspects of career planning at each of the levels.



Courses at each level are grouped into theme areas to provide additional structure and assist in career planning. By linking courses in themes, teachers can plan learning activities that align with student interests/needs and available resources.

## Curriculum and Assessment Standards

Refer to the *CTS Guide to Standards and Implementation*, Sections D, E and F.

Each CTS course clearly defines credible curriculum and assessment standards that are relevant to post-secondary education and the workplace. Students are expected to demonstrate higher degrees of competency and meet higher standards as they move through the course levels.

Curriculum standards define what students must know and be able to do. In CTS, these outcomes are communicated through general outcomes (module learner expectations in 1997 documents), with further detail provided in specific outcomes (specific learner expectations in 1997 documents).

Assessment standards establish the conditions and criteria for assessing student competency. For each course, CTS curriculum defines a minimum level of performance for each general outcome, with reference to assessment tools to ensure fairness and equity in judging student achievement.

## DESIGNING CTS COURSES

Refer to the *Guide to Education: ECS to Grade 12*.

Whereas the former practical arts courses were designed by Alberta Education, CTS is designed at the school/school system level by combining 1-credit courses that best suit the needs of students, the school/school system and the community.

The CTS curriculum structure allows schools and teachers to design courses:

- within and across CTS strands
- within and across CTS levels
- with other non-CTS core and optional courses.

Some students may successfully complete CTS courses while in junior high school. Competencies developed in junior high school may be recognized in senior high school.

Senior high schools may choose to design CTS courses that enable students to meet the optional course requirements for the Alberta High School Diploma, and develop competencies that align with those expected in the workplace and/or by post-secondary institutions.

# KEY FEATURES OF CTS

The following represents a summary of key features incorporated into the CTS program.

## CAREER-RELATED LEARNING

Refer to Appendix 5: Planning Ahead—CTS Transitions into Post-secondary Programs and the Workplace.

CTS offers students learning opportunities in a wide range of career contexts. Students become familiar with the many careers related to each strand, and are able to investigate various career options.

In CTS, the concept of career encompasses activities in one's personal life as well as those related to a job or occupation. Students develop competencies for:

- daily living and personal interest
- career planning and preparation
- entry into the workplace and post-secondary programs.

## TECHNOLOGY INTEGRATION

Technology outcomes are integrated as appropriate throughout all CTS strands, and focus on the development of competencies required for daily living, entry-level work and lifelong learning.

Refer to the *Learner Outcomes in Information and Communication Technology—ECS to Grade 12.*

CTS defines technology in its broadest sense to include all processes, tools and techniques that affect daily life, and provides opportunities for students to:

- make decisions regarding which procedures best suit the task at hand
- select and use available tools and resources in an appropriate manner
- assess and manage the impact of technology on self, others and the environment.

## BASIC COMPETENCIES

Refer to the *CTS Guide to Standards and Implementation*, Section A: Program Rationale and Philosophy.

Critical skills for daily living and employability are incorporated into each CTS strand and course through a set of "basic competencies." Sequenced around four developmental stages, the basic competencies establish standards of performance with respect to:

- managing learning
- managing resources
- problem solving and innovation
- communicating effectively
- working with others
- demonstrating responsibility.

## ONE-CREDIT COURSE STRUCTURE

Refer to the *CTS Guide to Standards and Implementation*, Section B: Strand Rationale and Philosophy.

The 1-credit course curriculum structure of CTS allows schools to design programs that enable students to:

- select relevant courses and strands
- progress at rates that are personally challenging
- build on successes and investigate new options.

Schools determine which strands/courses to make available to students, and the extent to which students are involved in planning their own CTS programs.

## CLEARLY DEFINED RESULTS

Refer to the *CTS Guide to Standards and Implementation*, Section G: Assessment Tools.

CTS courses emphasize competency-based learning rather than time-based learning. While each course is designed to take a student approximately 25 hours to complete, some students may need more or less time to obtain the competencies. The CTS curriculum defines:

- what students must know and be able to do—the knowledge, skills and attitudes to be developed (curriculum standards)
- the criteria and conditions for assessing student performance (assessment standards).

## BROAD-BASED RESOURCE SUPPORT

Refer to the *CTS Guide to Standards and Implementation*, Section I: Learning Resource Guide.

CTS supports the development of resource-based classrooms where a variety of appropriate, up-to-date print and nonprint resources are available. This approach enables students to:

- interact with a wide range of information sources
- assess and use information sources appropriately
- take an active role in managing their own learning.

CTS identifies learning resources in print, software, video and CDROM formats, as well as other sources of information available in the community and through the Internet.

## EXPANDED DELIVERY OPTIONS

Refer to the *Off-campus Education Guide for Administrators, Counsellors & Teachers*.

CTS supports a variety of learning opportunities and delivery strategies using technology and other resources available in the school and community. Learning can take place on- and off-campus, in classrooms, labs, the workplace or through distance learning.

CTS recognizes the importance of community support and involvement in the delivery of career-related education programs, and provides flexibility to plan program delivery in ways that meet local needs.

## ENHANCED CONNECTIONS

Refer to the *CTS Guide to Standards and Implementation*, Section H: Linkages/Transitions.

CTS links theory and practice in real contexts. Students gain confidence and motivation as they learn to relate, extend and apply abstract learning in a variety of real-life and work-related situations.

The 1-credit course structure of CTS facilitates making connections among CTS strands and with core and optional subjects. Connections identified throughout the CTS curriculum help students transfer their learning effectively and prepare for future career options.

## CONTINUITY IN LEARNING

Refer to the *CTS Guide to Standards and Implementation*, Section H: Linkages/Transitions.

CTS enables students to build on the competencies they have already achieved—prior learning from formal schooling and community/personal initiatives is recognized. There are no distinct boundaries between junior and senior high school, and numerous credentialling and articulation agreements at the intermediate and advanced levels provide effective bridging to the workplace or related post-secondary programs. This approach enables students to experience smooth transitions throughout their school careers.

# CURRICULUM DOCUMENTS AND OTHER MATERIALS

Refer to CTS at the Alberta Education web site <http://ednet.edc.gov.ab.ca> under "Students and Learning," then "Student Programs."

***Note**: Check memory capacity on your computer before downloading CTS documents.*

A number of legal and support documents and other materials are available to support the effective implementation of CTS programs.

To facilitate ease of access, all curriculum documents are available in print and electronic formats through the sources indicated. The most recent versions of curriculum documents can also be viewed and downloaded from the Alberta Education web site.

Sources:

- Learning Resources Distributing Centre (LRDC) (print and CDROM)
- Alberta Education Web Site.

## PROGRAM OF STUDIES

The *CTS Program of Studies*, 1997 is a legal document that outlines mandatory requirements for CTS courses in all strands. This document provides information regarding:

- program rationale and philosophy (Section A)
- strand rationale and philosophy, and general outcomes (Section B).

This is a required document for those planning CTS programs at schools and school system levels. Individuals responsible for delivering CTS courses on- or off-campus should also consult the support documents noted below for additional information regarding specific strands and courses.

## GUIDE TO STANDARDS AND IMPLEMENTATION (GSI)

Sources:
- LRDC (print and CDROM)
- Alberta Education Web Site.

There is a *Guide to Standards and Implementation*, 1997 to support each of the 22 CTS strands. The GSIs outline the mandatory course requirements in shaded format, and provide additional information useful in implementing strand-specific courses in schools and classrooms. Each GSI provides information regarding:

- the CTS program in general (Section A)
- strand rationale and overview (Section B)
- program planning (Section C)
- curriculum and assessment standards (Sections D, E and F)
- assessment tools (Section G)
- linkages/transitions (Section H)
- learning resources (Section I)
- sample student learning guides (Section J)
- individuals involved in strand development (Section K—print copy only).

The GSIs are highly recommended to those delivering instruction and assessing student achievement in specific CTS strands and courses.

## MANUAL FOR ADMINISTRATORS, COUNSELLORS AND TEACHERS (ACT MANUAL)

Sources:
- LRDC (print and CDROM)
- Alberta Education Web Site.

This *Career and Technology Studies Manual for Administrators, Counsellors and Teachers*, 1998 is a support document available to facilitate the effective implementation of all CTS strands and courses.

## OTHER MATERIALS

***CTS Communication Network Update***

Source:
- Alberta Education Web Site.

The *CTS Communication Network Update* is a newsletter published twice a year. It provides current information on CTS curriculum and resources, key issues affecting program implementation, opportunities for students, professional development, and successful practices/initiatives in CTS.

The newsletter is distributed to junior and senior high school principals, school system superintendents and all members of the CTS Communication Network. Individuals can join the CTS Communication Network by returning Form 2: CTS Communication Network Registration Form, which is included at the end of this section.

### CTS Tracker

Source:
- LRDC.

*CTS Tracker* (Version 3.2) is a database software program that assists administrators, counsellors and teachers to track CTS courses completed by students. The software is designed for Microsoft Windows (version 3.1 or later) or DOS (version 6.2 or later), and requires a minimum of 8 MB of RAM. Accompanied with a user manual, the program enables schools to:

- import student demographic data from student record systems
- identify courses being taken by a student
- print over 20 different reports, including student timetables, class lists, program/course profiles and student achievement reports
- assign teaching staff to specific CTS courses.

### CTS Promotional Materials

Refer to Appendix 1: Planning and Marketing CTS in Your School and Community.

The following brochures for promoting CTS in the school and community are available as blackline masters:

- *CTS Backgrounder,* 1998
- CTS Strand Brochures, Revised 1998.

### CTS Videos

Source:
- ACCESS: The Education Station.

The following videos provide an effective means of explaining CTS to clients and stakeholders in the school and community.

- *CTS: Building the Future*, 1996 explains the philosophy, curriculum structure and potential benefits of the CTS program. Designed for viewing by adults, the video is divided into distinct segments and may be used for inservice and orientation sessions. The video is accompanied by a brochure (available in quantity) that describes key features of the CTS program (25 minutes).
- *Opportunities for You*, 1996 profiles CTS along with related programs and initiatives. Designed for use with students, the video focuses attention on technical career opportunities, and is accompanied with a questionnaire to assist students in career planning (15 minutes).
- *On Cue*, 1993 introduces teachers, administrators, parents and the community-at-large to the CTS program. The video is divided into distinct segments and may be used for inservice and orientation sessions (30 minutes).
- *U-Choose*, 1993 describes the CTS program and the 22 CTS strands to students (11 minutes).

# DEVELOPING AN IMPLEMENTATION PLAN

The following steps assist in planning for the effective implementation of CTS programs at the school and school system level.

## DEVELOP AN UNDERSTANDING OF THE CTS PROGRAM

Schools and school systems are encouraged to design a communication plan to inform all client and stakeholder groups about the goals and structure of the CTS program. The communication plan should include an initial orientation to CTS, and ongoing strategies to reinforce and expand understanding of the CTS program and how it is evolving in the school and community.

To assist in this task, information packages can be developed and modified to address the needs of different groups. As well, it is helpful to keep informed of implementation initiatives undertaken in other communities.

When developing their communication strategies, schools and school systems may wish to:

- access the promotional materials and videos on CTS
- share ideas with neighbouring schools and school systems.

## PREPARE AN IMPLEMENTATION PLAN

Refer to Appendix 1: Planning and Marketing CTS in Your School and Community.

Successful implementation of CTS requires the coordinated effort of school and school system administrators, counsellors and teachers. While implementation plans vary according to the unique characteristics of individual schools and school systems, successful implementation of CTS involves:

- establishing a planning team
- drafting a plan of action
- taking inventory of in-school and community resources
- researching interests/needs and potential sources of support in the community
- identifying potential strands/courses, appropriate for on-site and/or off-campus delivery
- identifying potential barriers to implementation and possible solutions
- gaining commitment, buy-in and approval for action
- monitoring and assessing progress.

Refer to the *CTS Guide to Standards and Implementation*, Section H: Linkages/Transitions.

Prior to implementing CTS programs, careful consideration should be given to:

- the anticipated scope of change in school programming
- the expected rate at which these changes will occur.

To assist teachers in making the transition from practical arts to CTS, a correlation of CTS courses to the former practical arts courses they replace is provided for each strand.

## SELECT STRANDS/COURSES

Refer to Appendix 2: Defining CTS Learning Environments—Strand and Course Parameters.

Schools decide which CTS strands and courses to offer on the basis of student interests/needs and resources available in the school and community. **Course design and selection must address prerequisites and other delivery requirements defined in the strand and course parameters.**

Individual schools may select which CTS strands they wish to offer. Schools and teachers design CTS programs by combining 1-credit courses:

- within and across strands
- within and across levels—introductory, intermediate, advanced
- with other non-CTS core and optional courses.

When designing CTS programs, teachers need to be familiar with courses:

- in strand clusters; e.g., business education, home economics, industrial education, natural resources. CTS programs can often be enhanced by including courses from two or more related strands
- in "process" strands; e.g., Enterprise and Innovation, Design Studies, Information Processing, Management and Marketing. Learning in these strands can be effectively contextualized when their courses are combined with other strands that are more specialized in context
- in the Career Transitions strand; e.g., courses from the Career Extensions, Career Credentials and Job Safety Skills themes. These courses directly reinforce employability skills and can be used effectively to extend learning in other CTS strands.

## SELECT TEACHERS TO DELIVER THE PROGRAM

Refer to Appendix 2: Defining CTS Learning Environments—Strand and Course Parameters.

A key factor in the effective delivery of CTS courses is the involvement of qualified and enthusiastic teachers. While many courses can be delivered by certified teachers having expertise and interests suited to providing instruction in CTS settings, some courses require additional instructor qualifications over and above a regular professional teaching certificate. These qualifications may include:

- a specific credential granted by business, industry, government or a community organization; e.g., journeyman certificate, Alberta Best Trainer, First Aid certificate
- evidence of successful completion of a specialized training program or equivalent; e.g., a workshop/course from a technical institute/college/university, a session at the CTS Leadership Seminar.

**Teacher selection processes must address the instructional qualifications as defined in the strand and course parameters.**

Schools may find it desirable to expand human resources available for the delivery of CTS programs by:

- providing effective teacher orientation and inservice
- encouraging collaboration and teamwork
- involving teachers from other core/optional subject areas
- involving instructional assistants—community partners—having specialized knowledge and skills
- establishing partnerships with post-secondary institutions.

## PREPARE STUDENT PROGRAMS

CTS is available to all secondary students having the potential to meet the requirements of an Alberta High School Diploma. While schools establish their own strategies and criteria for placing students in CTS courses, these practices should reflect student interests and needs.

Some students with special needs may benefit from instruction in some CTS strands and courses, particularly those involving considerable hands-on learning with limited emphasis on theory. Counsellors and teachers can help students with special needs make the transition to CTS by making provision for:

- supportive learning environments and differentiated instruction
- flexible transfer points into and out of the CTS program.

**Students with special needs taking CTS courses for credit are expected to meet all requirements for successful course completion.** In situations where curriculum is modified and no credit is granted, such changes should be recorded on the student's individual program plan.

## IDENTIFY APPROPRIATE LEARNING ENVIRONMENTS

Refer to:
- Appendix 2: Defining CTS Learning Environments— Strand and Course Parameters
- Appendix 3: Addressing Health and Safety in CTS.

Some CTS courses can be delivered in regular classrooms, while others require the use of more specialized facilities. CTS encourages schools to use on- and off-campus learning environments in addressing student needs. **Learning environments, whether on-campus or off-campus, must address the policies and guidelines for facilities, equipment and safety as defined in the strand and course parameters.**

Schools may find it desirable to expand learning environments suited to the delivery of CTS programs by:

- making innovative and effective use of existing facilities and equipment
- carrying out renovations to existing facilities
- using facilities and equipment in the community
- sharing facilities and equipment in neighbouring schools and school systems
- using distance learning technologies and other alternative delivery strategies.

CTS learning environments should provide opportunities for students to work individually or with others in a supportive atmosphere that reflects due attention to health and safety. When possible, work areas for CTS should:

- be flexible and multipurpose, supporting hands-on learning as well as research, note-taking and discussion
- enable teachers to observe, supervise and assess student performance readily
- facilitate a shared and team approach to instructional delivery
- provide easy access to learning resources, computers and other technology
- provide adequate and secure storage.

## ESTABLISH SCHEDULING/DELIVERY STRATEGIES

Refer to the *CTS Guide to Standards and Implementation*, Section C: Planning for Instruction.

Schools and school systems are encouraged to consider the many methods of course delivery available to them when they plan course offerings in CTS. While most strands and courses can be offered through standard class scheduling practices, the structure of CTS, its focus on competency rather than time-based learning, and the use of off-campus delivery and enhanced distance learning tools enable schools to expand student access to CTS strands and courses.

Schools may choose to maximize options available for delivering a range of CTS courses by modifying current class scheduling practices, and/or combining them with other methods of course delivery. Specific scheduling and delivery strategies will be determined by:

- the strands and courses being offered
- teacher background and instructional approach
- resources available in the school and community
- the degree of choice and self-direction provided for students.

**Regardless of particular course scheduling and delivery strategies adopted by schools, any method of delivering CTS courses must ensure that:**

- **students are apprised of their registration in CTS courses, and their right to choose optional courses is maintained**
- **the teachers who provide or supervise the instruction are certificated and knowledgeable about the course**
- **students are provided access to a minimum of 25 hours of instruction per credit at the high school level, with exceptions as noted in the *Guide to Education: ECS to Grade 12***
- **the instruction, and evaluation of performance, is based on the learner expectations or outcomes in the CTS program of studies**
- **there are designated times when teachers are available to the students**
- **students know, prior to enrolling in courses, how and when they will be able to access the instructional expertise of teachers.**

Refer to the *Guide to Education: ECS to Grade 12*, Program Planning.

## Standard Class Scheduling

Standard class scheduling involves timetabling CTS classes using the Carnegie Unit organizational model; i.e., a time-credit relationship. Such practices, usually established at the school level through various software programs, provide for instruction through clearly defined time blocks. Standard class scheduling can be effectively used to timetable CTS classes, assign students and teachers, and monitor attendance.

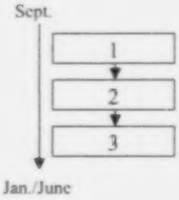
Using typical timetabling practices, schools may decide to:

- schedule a specific CTS course within an instructional time block
- schedule multilevel courses concurrently within an instructional time block
- schedule time blocks when students select from a menu of courses
- cycle particular strands/courses over semesters or school years.

CTS emphasizes experiential learning. It is important that students have opportunities to demonstrate and practice the competencies they develop. Class length should provide sufficient time for hands-on experiences as well as work set-up and clean-up. Class sequencing should provide frequent opportunities for students to practise the skills they are learning.

The following scenarios represent possible ways of organizing for instruction with standard time blocks.

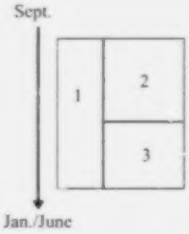
Scenario A



Students move through courses sequentially; e.g.,

INF1020 Keyboarding 1
INF2030 Keyboarding 2
INF2040 Keyboarding 3

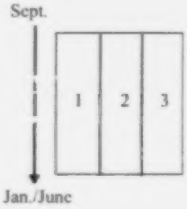
Scenario B



Students work on one course throughout the year/semester (e.g., 20 minutes per class or one class per week) and then spend the remainder of the class time working on other courses; e.g.,

COM1010 Presentation & Communication 1 (throughout the term)
COM1030 Photography 1
COM1050 Printing 1

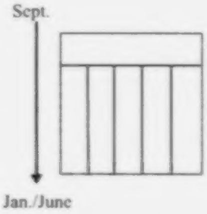
Scenario C



Students work on three courses within an instructional time block. This strategy is often used when students are working on an integrated project, such as operating a school store or handling customer work; e.g.,

MAM1010 Management & Marketing Basics—one class per week
MAM1020 Quality Customer Service—first half of class
MAM2040 Retail Operations

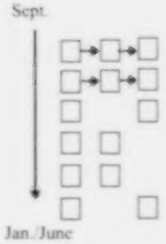
Scenario D



All students work on one or more courses together, then are able to select from a list of courses that are available for individual or small group learning. The menu of courses could be from one or more strands.

Scenario E

From a list of courses defined by the teacher, students select which ones they will work on and, in consultation with the teacher, establish timelines for completion and submission of assignments, etc.



## Expanded Delivery Options

Schools also may wish to consider other methods for expanding or enhancing delivery of CTS programs, keeping in mind that the quality of interaction between student and teacher has a profound influence on learning. Many of the options outlined below can be used as an extension to, or in combination with standard class timetabling.

Shared Delivery

Schools may decide to expand their delivery of CTS programs by making expertise and/or resources present in one school available to other schools. Sharing may occur among schools within the same school system, or through special agreements with schools in a neighbouring system. Shared delivery may involve the use of mobile labs, the sharing of teachers among schools, and/or the bussing of students to other schools offering complementary programs and facilities.

Off-campus Delivery

Refer to the *Off-campus Education Guide for Administrators, Counsellors & Teachers.*

CTS courses or course components can be delivered outside the school classroom or lab through off-campus education. Through worksite learning and partnerships with local business/industry and post-secondary institutions, off-campus education provides access to instructional expertise and specialized facilities available within the community. Off-campus education may encompass community partnerships, job shadowing, job sharing, mentorships, and work study.

Combining CTS and Non-CTS Courses

The 1-credit course structure of CTS allows flexibility in delivering courses by combining CTS courses with other core and optional courses. Such strategies are effective in helping students make connections in their learning across the curriculum.

**When schools combine a CTS course with a non-CTS course the following shall apply:**

- **the teachers who provide or supervise the instruction are certificated and knowledgeable about both the CTS and non-CTS course**
- **prior to registration, schools provide information to parents and students about the philosophy of each of the integrated courses, the learner outcomes of each of the integrated courses and how student learning will be assessed in each of the integrated courses**
- **information and counselling services make clear that registration in an integrated course is optional**
- **students have access to a minimum of 25 hours of instruction per credit**
- **teachers offer each of the integrated courses in accordance with the approved programs of study**
- **students meet the standards specified in the 1-credit CTS course for all learner outcomes within that 1-credit course in order for a teacher to provide a passing grade in the CTS component**
- **the CTS course and the non-CTS course must be graded separately, and credits must be awarded and reported separately**
- **if a CTS course is being integrated with a non-CTS course, then any prerequisite to the CTS course must be met first**
- **a student who has already gained credit in the integrated 1-credit CTS course is not eligible to earn another credit for the same 1-credit CTS course.**

### Distance Education Technology

The use of information, communication and multimedia technologies can be another effective means of expanding and/or enhancing the delivery of CTS courses. Distance education technology can be used to:

- help students learn difficult concepts
- deliver instruction in new areas where there may be a lack of teacher expertise.

Refer to Appendix 2: Defining CTS Learning Environments—Strand and Course Parameters.

While the potential for distance education technology to deliver a range of CTS courses is expanding rapidly, some courses focus on the development of workplace competencies and cannot be effectively delivered unless the student has access to hands-on learning, either in a lab or worksite setting. Such courses do not lend themselves to technological delivery unless supported by other forms of instruction and practice.

Expanded Time Frames

Refer to the *Guide to Education: ECS to Grade 12*, Program Planning.

Offering CTS courses during the evening, on weekends and in the summer can be yet another means of providing flexible delivery options and making efficient use of school and community resources. The same requirements for course delivery as noted previously apply, with the exception that for these courses, schools must provide access to instruction of at least 16 hours per credit.

## PREPARE LEARNING PLANS

Once organizational strategies regarding where and how learning is to occur have been established, teachers can begin to prepare learning plans. Learning plans determine how the competencies defined within specific courses are to be developed and assessed.

Refer to the *CTS Guide to Standards and Implementation*:
- Section D: Introductory Level
- Section E: Intermediate Level
- Section F: Advanced Level.

Learning plans should address both the basic competencies and strand-specific competencies referenced as general outcomes (module learner expectations in 1997 documents). Additional guidelines for preparing learning plans are provided through the specific outcomes (specific learner expectations in 1997 documents). Though not prescriptive, the specific outcomes provide further information regarding the depth and scope of learning expected for each course.

In general, learning plans should include:

- assignments/projects/tasks that develop the defined competencies
- strategies to assess student performance and achievement
- resources that support learning outcomes
- timelines and task/laboratory schedules.

### Student Learning Guides

A Student Learning Guide (SLG) provides information and direction to help students attain the outcomes defined in a CTS course. SLGs are designed to be used by students under the direction of a teacher. Components of an SLG include:

- Why take this course?
- What do you need to know before you start?
- What will you be able to do when you finish?
- When should your work be done?
- How will your mark for this course be determined?
- Which resources may you use?
- Activities/worksheets.

Refer to the *CTS Guide to Standards and Implementation*, Section J: Sample Student Learning Guides.

While a development template accompanied by some sample SLGs is provided for each CTS strand, most SLG development is being done by individuals and organizations across the province. Teachers are encouraged to share their SLGs through the CTS WebBoard.

Teachers should note that an SLG is not a self-contained learning package like those produced by the Learning Technologies Branch.

**Distance Learning Materials**

Refer to the Learning Technologies Branch home page at <http://ednet.edc.gov.ab.ca/ltb>.

The Learning Technologies Branch is developing distance learning materials for courses in a number of CTS strands. Distance learning materials are self-contained learning packages that typically include the type of information provided in a Student Learning Guide and additional resource materials for the student.

Teachers are advised to consult the Learning Technologies Branch home page for information regarding the availability of distance learning materials in particular strands and for future development schedules.

## CTS IN JUNIOR HIGH SCHOOL

### PROGRAM PLANNING

Each junior high school determines which CTS strands and courses to offer. Because few junior high students have made specific career decisions and plans, they are better able to learn about different career areas if they can explore several of the CTS strands along with other optional courses.

Experience has demonstrated that male and female students do equally well in CTS programs. When possible, planning should facilitate co-ed classes in most CTS strands.

**Selecting Strands/Courses**

Junior high schools are encouraged to develop CTS programs that focus on personal skills for daily living and career exploration. While all CTS strands can be delivered at the junior high school level, some strands have a more specialized occupational focus and may be less relevant to the junior high school student.

Introductory level courses are considered most appropriate for junior high school students as they focus on developing competencies that are useful for daily living and form a foundation for further study within the strand. Junior high schools may also choose to deliver intermediate level courses, particularly in areas where students may have previously developed competencies.

When selecting CTS courses, junior high schools should take into account the strands/courses available to students when they enter high school, and design courses accordingly.

### Designing Courses

Refer to the *CTS Guide to Standards and Implementation*, Section C: Planning for Instruction.

Junior high schools may design CTS courses by combining:

- components of courses within and across strands to enable students to explore a range of career options
- complete courses within and across strands to enable students to acquire knowledge and skills prerequisite to further study.

Course design in junior high school may involve sequencing the delivery of course components over a period of one, two or three years.

**Course prerequisites and recommended sequences are defined in the scope and sequence chart for each strand.**

Courses offered at the junior high school level can be named Career and Technology Studies (CTS), given specific strand names such as Agriculture or Design Studies, or given other names considered appropriate in communicating the nature of the learning.

## EFFECTIVE TRANSITIONS

CTS encourages students to build upon prior learning that may have occurred through formal schooling and personal initiatives. Within this context, junior high students who have already developed competencies defined within a course should have opportunities to expand upon or enhance these competencies as they move through their school experience.

### Elementary to Junior High

Some students entering junior high school may have already developed CTS-related competencies in the elementary school years. As well, many elementary students are already accustomed to working in multi-activity and independent learning environments. Junior high schools are encouraged to consult with feeder schools to determine the level of expertise students bring to junior high school, and plan their CTS courses accordingly.

### Junior High to Senior High

Junior high schools should become knowledgeable of the strands/courses available at high school and design their courses accordingly. Junior and senior high school teachers and administrators are encouraged to share information regarding:

- which CTS strands/courses they are delivering
- where and how CTS courses are being delivered
- strategies used to organize for learning; e.g., class timetabling, flexibility and degree of student choice
- policies regarding the recognition of prior learning.

Awareness of each other's programs and flexible approaches to program planning facilitates effective transitions from junior to senior high school.

**Recognizing Prior Learning**

Refer to the *Guide to Education: ECS to Grade 12*, Courses and Programs.

**Some students may successfully complete CTS courses while in junior high school. The senior high school principal may accept a recommendation from the junior high school principal that a student has successfully completed a course and should be given credit.**

Junior high schools need to determine the practices adopted by local high schools regarding recognition of prior learning in CTS, and advise students and parents accordingly.

## CTS IN SENIOR HIGH SCHOOL

### PROGRAM PLANNING

While the emphasis of CTS programs in junior high school is on daily living skills and career exploration, CTS programs in senior high school focus on building transitions to the workplace or related post-secondary programs.

Each senior high school determines which CTS strands and courses to offer. Some students entering high school may wish to expand on the competencies they have already developed within a particular strand. Other students may wish to expand their repertoire of competencies by working in other strands.

**Selecting Strands/Courses**

Intermediate- and advanced-level courses are generally most appropriate for high school students, particularly those in Grade 11 and Grade 12, as these courses focus more directly on technical and career-related competencies. Senior high schools may also deliver introductory-level courses, particularly in strand areas where students may not have developed the prerequisite knowledge and skills.

When selecting CTS strands and courses, senior high schools should take into account prior learnings acquired by students in junior high school and through personal initiatives, and design courses accordingly.

**Course Delivery**

Senior high schools may deliver CTS by combining 1-credit courses:

- within and across strands, and
- within and across levels (introductory, intermediate, advanced).

While schools are encouraged to consider flexible methods of planning and delivering courses that best meet the needs of students, care is needed when planning senior high school CTS courses to ensure they:

- **deliver all the general outcomes of a course (MLEs in 1997 documents)**
- **preserve the student's right to access to instruction**
- **do not offer double credits for the same learning.**

Refer to the *Guide to Education: ECS to Grade 12,* Senior High School Programming.

**Course prerequisites and recommended sequences are defined in the scope and sequence chart for each strand. Plans for course delivery must ensure that students have access to a minimum of 25 hours of instruction per high school credit, unless otherwise specified in the *Guide to Education: ECS to Grade 12*.**

Advanced-level courses may be used by students to meet the high school diploma requirements. Schools need to review the course combinations made available to ensure that students have access to an adequate number of advanced-level courses to meet the 30-level credit requirements for the Alberta High School Diploma.

Schools may combine courses into multiple-credit clusters for scheduling and instructional purposes. However, the courses are to be reported to Alberta Education as 1-credit courses. At the school level, course names may be used that clarify learning outcomes for students and parents.

## EFFECTIVE TRANSITIONS

An important goal of the CTS program is to enhance transitions from junior high school to senior high school, and from senior high school into the workplace or related post-secondary programs. Within this context, senior high school students should have opportunities to:

- expand upon or enhance competencies they may have already developed through formal schooling and personal initiatives
- develop competencies that prepare them for entry into the workplace or related post-secondary programs.

**Junior High to Senior High**

Senior high schools should become knowledgeable of the strands/courses offered to students at junior high school, and take this information into account as they plan their CTS programs. Junior and senior high school teachers and administrators are encouraged to share information regarding:

- which CTS strands/courses they are delivering
- where and how CTS courses are being delivered
- strategies used to organize for learning; e.g., class timetabling, flexibility and degree of student choice
- policies regarding the recognition of prior learning.

Awareness of each other's programs and flexible approaches to program planning facilitates effective transitions from junior to senior high school.

## Senior High to the Workplace

Refer to the *CTS Guide to Standards and Implementation*, Section H: Linkages/Transitions.

Many young people experience challenges upon entering the workplace. In preparation for this critical step, students can be provided with opportunities to explore options for employment through work study, job shadowing, mentorship and other forms of off-campus learning. Each CTS strand is supported with a comprehensive list of related occupations and career opportunities.

A number of credentialling opportunities are available to CTS students through professional and community organizations, whereby students may earn partial or complete credentials recognized in the workplace. CTS courses can be designed in ways that enable students to obtain credentials that enhance opportunities for entry into the workplace.

## Senior High to Post-Secondary

Many CTS students upon completing particular course sequences have developed competencies that align with those expected in post-secondary programs. A summary of related post-secondary programs offered at the college, technical and university level, as well as through Apprenticeship and Industry Training, is published periodically in *It's About Time to Start Thinking About Your Future* by Alberta Advanced Education and Career Development, and is available for purchase from the LRDC.

Refer to the *CTS Guide to Standards and Implementation*, Section H: Linkages/Transitions.

A number of articulation agreements have been established with post-secondary institutions and training programs in Alberta. These agreements provide preferred entrance and/or advanced standing for CTS students who have successfully completed designated courses. Advanced-level courses will be accepted in lieu of 30-level practical arts courses in qualifying for post-secondary entrance.

The Alberta Heritage Scholarship Fund combines and averages the marks of CTS courses taken at the same level (i.e., introductory, intermediate) to establish 3 credits that can be considered for the Alexander Rutherford Scholarship. In cases where more than three courses have been taken at the same level, the three courses with the highest marks are combined and averaged.

## Recognizing Prior Learning

Students should be encouraged to refine and extend competencies they may have developed in junior high school or through personal initiatives. To do this, high schools need to establish practices for recognizing students' prior learning.

### Courses Completed in Junior High

Some students may successfully complete CTS courses while in junior high school. The senior high school principal may accept a recommendation from the junior high school principal that a student has successfully completed a course and should be given credit. This course then can be included when reporting student achievement through the normal student records system. The course(s) also will then be included in the student's transcript.

Refer to the *Guide to Education: ECS to Grade 12*, Senior High School Courses and Credits for Junior High School Students.

Such courses are to be reported by the senior high school principal according to the directions provided in the *Guide to Education: ECS to Grade 12*. **High school credits granted upon the recommendations of a junior high school principal are not eligible for Credit Enrollment Unit (CEU) funding.**

Local policies regarding the granting of credits for prior learning in CTS should be established collaboratively and communicated to all clients and stakeholders. These policies may include provisions for challenge assessment.

### Course Challenge

Refer to the *Guide to Education: ECS to Grade 12*, Course Challenge.

Course challenge may be appropriate for students who, because of prior learning, have demonstrated the ability to meet the assessment standards established for specific 1-credit courses. Course challenge assessment may occur through:

- a traditional comprehensive examination
- teacher observation over three to four classes
- teacher evaluation of a student's portfolio or work sample
- a student's demonstration of skills through performance of set tasks.

Successfully challenged courses are to be reported as passed courses according to the directions provided in the *Guide to Education: ECS to Grade 12*.

## SELECTING AND USING LEARNING RESOURCES

CTS encourages teachers to establish resource-based classrooms where a variety of appropriate, up-to-date print and nonprint resources, such as print, software, video, CDROM and other electronic formats, are available.

## AUTHORIZED LEARNING RESOURCES

To assist teachers in identifying a variety of resources to meet their needs and the learning needs of students, Alberta Education has authorized learning and teaching resources for use in each of the CTS strands. **While an authorized resource meets high standards and can contribute to the attainment of the goals of the CTS curriculum, authorization does not require its use in course delivery**. Decisions regarding the selection and use of resources are a local matter and should take into account student skill levels, interests and stages of development.

### Basic, Support and Teaching Resources

Resources authorized by Alberta Education for CTS are categorized as:

- basic student learning resources—resources that address the majority of the learner outcomes in one or more courses
- support student learning resources—resources that assist in addressing some of the learner outcomes of a course
- authorized teaching resources—resources that assist teachers in the instructional process.

Refer to the *CTS Guide to Standards and Implementation*, Section I: Learning Resource Guide.

Authorized resources are identified in the CTS curriculum documents for each strand by title and format, and are accompanied with:

- bibliographic information
- an annotation, where appropriate
- a correlation to CTS courses
- recommendations for use in junior and/or senior high school
- distributor/vendor information.

Although listings of authorized resources in the curriculum documents are maintained on a regular basis, this information is time-sensitive and subject to change. To obtain the most up-to-date information on authorized resources for each CTS strand—new resources, more recent editions/versions—teachers are encouraged to browse the database of authorized resources on Alberta Education's web site.

### Learning Resources Distributing Centre

Refer to the LRDC *Buyers Guide* or web site at <http://ednet.edc.gov.ab.ca/lrdc>.

Most authorized learning resources are available for purchase from the Learning Resources Distributing Centre (LRDC). A current listing of newly approved resources available through the LRDC can be accessed electronically through their web site.

Authorized resources can also be obtained directly from the publisher or distributor. It is recommended that teachers preview all resources before purchasing, or purchase a single copy for their reference and additional copies as required.

## OTHER SOURCES OF INFORMATION AND SUPPORT

**Other Resources**

Refer to the *CTS Guide to Standards and Implementation*, Section I: Learning Resource Guide.

Also included in the curriculum documents for each CTS strand is a list of other resources. These titles have been provided as a service only to assist local school systems to identify resources that contain potentially useful ideas for teachers. Alberta Education has done a correlation to CTS courses. **Teachers are advised, however, that further review will be necessary prior to their use in the learning process.**

**Additional Sources of Information**

Refer to the *CTS Guide to Standards and Implementation*, Section I: Learning Resource Guide.

Teachers are encouraged to consider opportunities for enhancing their delivery of CTS courses through the use of other sources of information readily available at local, provincial and national levels. Each strand provides a partial listing of additional information sources potentially available through the community, government, industry and professional organizations. Also identified as appropriate for each strand are sources of information available through the Internet.

## ESTABLISHING RESOURCE-BASED CLASSROOMS

Resource-based classrooms can accommodate a variety of instructional strategies and teaching styles, and support individual or small group planning. They provide students with opportunities to interact with a wide range of information sources in a variety of learning situations.

Schools are encouraged to establish CTS resource centres that include:

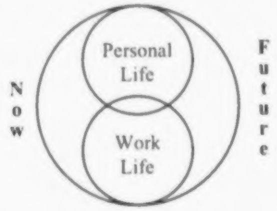
- copies of various learning and teaching resources that have been authorized for each strand
- copies of other resources identified in each strand
- relevant magazines, periodicals and newsletters
- multimedia resources, including videos and CDROMs
- samples of student work.

Access to a broad resource base enables students to learn to screen and use information appropriately, solve problems, meet specific learning needs, and develop competency in communication skills.

# INTEGRATING CAREER-RELATED LEARNING

A key feature of CTS is its focus on "careers" in a wide range of contexts. A career not only relates to a person's job or occupation, but also involves one's personal life—as a family member, a friend, a community volunteer, a citizen. Competencies developed through personal interest during secondary school often form the foundation for a future career choice.

**CAREERS**



*Career*—the sum total of life's experiences
*Occupation*—a cluster of similar jobs
*Job*—a position of work in an organization.

Junior and senior high schools should plan CTS programs in ways that enable students to explore their goals in life and work, now and in the future. Career-related learning should begin in junior high school and continue through the high school years so that by the time students graduate they have developed competencies for:

- daily living and personal interest
- career planning and preparation
- entry into the workplace or post-secondary programs.

## DAILY LIVING/PERSONAL INTEREST SKILLS

Many CTS courses identify competencies that people consider essential for daily living, such as financial management, nutrition and basic meal preparation, consumer decision making, and the use of information and communication technology. In addition, CTS provides access to courses that support the pursuit of hobbies and other recreational interests.

Refer to the *CTS Guide to Standards and Implementation*, Section B: Strand Rationale and Philosophy, and Scope and Sequence.

By reviewing the scope and sequence charts for the CTS strands offered, schools can identify courses that:

- provide an introduction to each strand
- develop skills for daily living and personal use
- provide a foundation of knowledge and skills that support further specialization in the strand.

## CAREER PLANNING AND PREPARATION

As students progress through each level of learning in CTS, they develop skills in career planning, explore numerous strand-related career options, and begin to prepare for present and future career options.

### Career Awareness

Refer to relevant career web sites, including:

- OCCINFO <www.aecd.gov.ab.ca/occinfo>
- CAREER INFORMATION HOTLINE <www.aecd.gov.ab.ca/hotline>
- HUMAN RESOURCES DEVELOPMENT CANADA <http://roe-ab.hrdc-drhc.gc.ca>.

Refer to the *CTS Guide to Standards and Implementation*, Section H: Linkages/Transitions.

Junior and senior high schools are encouraged to use current labour market information in developing career awareness within the context of specific strands and courses. Competencies relevant to career planning and awareness are defined within each CTS strand through learner outcomes (learner expectations in 1997 documents).

Clearly defined assessment standards and tools provide further benchmarks for establishing appropriate levels of career awareness within specific CTS courses.

Each CTS strand is supported with a comprehensive list of related occupations and career options that align with National Occupational Classification (NOC) descriptions. Approximately 800 linkages to the labour market are identified across the 22 CTS strands, each further described by educational and training requirements.

### Career Readiness

Refer to the *Career Transitions Guide to Standards and Implementation*, Section B: Strand Rationale and Philosophy.

The Career Transitions strand provides extensive opportunities for career preparation through its themes on Career Readiness, Leadership, Career Extensions, Career Credentials and Job Safety Skills.

Of particular relevance to career planning and preparation at the high school level are courses in the Career Readiness theme:

- CTR1010: Job Preparation
- CTR2010: Job Maintenance
- CTR3010: Preparing for Change.

Schools can design courses that prepare students for particular careers by combining one or more courses from the Career Transitions strand with intermediate- and advanced-level courses from other strands having an industry focus.

### Employability Skills

Refer to the *CTS Guide to Standards and Implementation*, Section A: Program Rationale and Philosophy.

Career preparation is further enhanced through a set of basic competencies or employability skills integrated throughout all CTS strands and courses. The basic competencies align with critical skills for employability identified by the Conference Board of Canada, and are organized around four developmental stages that address the learning needs of junior and senior high school students. The basic competencies are included as appropriate in curriculum and assessment standards defined for each CTS course.

## WORKPLACE AND POST-SECONDARY TRANSITIONS

The relevance and credibility of CTS within career contexts is enhanced through the extensive contributions to curriculum development by representatives of business and industry, professional associations and post-secondary institutions. Many students who complete intermediate- and advanced-level courses in one or more CTS strands develop competencies that align with those expected in the workplace and/or by post-secondary institutions.

### Credentials for the Workplace

A credential provides written evidence by agencies external to the school of a student's qualifications with respect to particular competencies. CTS students may earn partial or complete credentials recognized in the workplace or by post-secondary institutions through their work in particular CTS strands and courses.

Students can earn credentials by successfully meeting the curriculum and assessment standards established for:

- specific credential-bearing courses
- generic "practicum" courses from the Career Transitions strand that incorporate learnings requisite to particular credentials.

Refer to Appendix 5: Planning Ahead—CTS Transitions into Post-secondary Programs and the Workplace.

Each CTS strand provides information regarding relevant credentialling opportunities. Schools and school systems can use this information as a basis for further research and planning regarding credentials they may wish to offer through CTS. Schools should determine which credentials are viable in their community, and plan courses that incorporate these opportunities when appropriate.

### Articulation with Post-Secondary

Refer to:

- *CTS Guide to Standards and Implementation*, Section H: Linkages/ Transitions
- CTS at the Alberta Education web site under "What's New and Upcoming Events?".

A number of articulation agreements have been established with post-secondary institutions and training programs in Alberta. While the agreements vary in terms of how prior learning in CTS is recognized, most provide preferred entrance, advanced placement and/or advanced standing for CTS students who have successfully completed designated courses or course sequences. Schools and school systems are encouraged to consult local post-secondary institutions regarding:

- recognition of locally offered CTS courses
- the status of existing articulation agreements established at the provincial level.

### Articulation with the Alberta Apprenticeship Training Program

Refer to Appendix 5: Planning Ahead—CTS Transitions into Post-secondary Programs and the Workplace.

Articulation agreements have been established between CTS strands and a number of the Alberta Apprenticeship Training Programs. Through these agreements, students who complete required CTS courses and successfully challenge appropriate theory and practical examinations for particular trades may qualify for:

- a portion of the trade's in-school training program, and/or
- on-the-job time credit within the trade.

At present, articulation agreements are in place with the Automotive Service Technician, Carpenter, Cook, Hairstylist and Welder trades.

## Off-campus Learning

Refer to the *Off-campus Education Guide for Administrators, Counsellors & Teachers*.

A variety of off-campus learning experiences are suggested throughout the CTS curriculum—work study, work experience, job shadowing, mentorship. Each provides valuable opportunities for students and schools to enhance connections with business/industry, professional associations, post-secondary institutions or other community groups.

### Work Experience Program

The Work Experience program is designed to provide high school students with experiential learning in career-related contexts. Work Experience courses are delivered off-campus under the supervision of a community partner, and enable students to develop:

- an understanding of expectations in the workplace
- knowledge and skills relevant to a specific career.

Although Work Experience and CTS are separate programs, CTR1010: Job Preparation is a prerequisite for all Work Experience courses. Schools may choose to register students concurrently in CTS and Work Experience courses.

### Registered Apprenticeship Program

The Registered Apprenticeship Program (RAP) is designed for high school students who wish to begin a trade apprenticeship while completing their high school diploma. A RAP apprentice accumulates hours of on-the-job training as credit toward both a journeyman certificate and a high school diploma. RAP 15–25–35 courses are taught through off-campus learning under the joint supervision of a certified teacher and a journeyman in the workplace.

Although RAP and CTS are separate programs, courses in each may complement one another.

## THE ROLE OF THE CTS COUNSELLOR

The role of the school counsellor in CTS is one of helping students make effective career decisions through awareness and preparation. Counsellors can help students plan their junior and senior high school CTS programs, identifying strands and courses most appropriate to:

- long- and short-term goals
- interests and aptitudes
- learning styles and abilities.

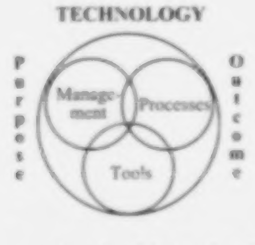
Through effective partnerships with other school personnel, counsellors can assume a key role in coaching CTS students to:

- explore a range of career and occupational opportunities
- plan the necessary steps to meet entry-level requirements for particular career choices
- negotiate effective transitions to the workplace or related post-secondary programs.

Counsellors can also help CTS teachers and administrators to determine which strands and courses should be made available to students, and help them, parents and community partners to understand the nature and structure of the CTS program.

## INTEGRATING TECHNOLOGY OUTCOMES

A key feature of CTS is its focus on the use of technology. In its broadest sense, technology includes all the processes, tools and techniques that affect daily life. Technology is more powerful today than ever, creating ways of living, working and thinking never before imagined. Technology outcomes in CTS reinforce, extend and enhance related skills developed in earlier grades and in other courses.



CTS programs in junior and senior high school provide opportunities for students to develop technology skills required for daily living, entry-level work and lifelong learning. These skills involve:

- making effective decisions regarding which processes or techniques best suit a particular task
- selecting and using appropriate tools and resources in a skilled manner
- assessing and managing the impact of technology on self, others and the environment.

## TECHNOLOGY FRAMEWORK: ECS TO GRADE 12

Refer to *Learner Outcomes in Information and Communication Technology: ECS to Grade 12.*

To assist students to understand, use and apply technologies in effective, efficient and ethical ways, Alberta Education has conducted an extensive review of technology curricula around the world. Based on the results of this review, a framework for learner outcomes in information, communication and multimedia technology for ECS to Grade 12 students has been developed.

The framework not only identifies outcomes already included in CTS and other current programs of study, but also anticipates the knowledge, skills and attitudes that students may need in the future as technology continues to change and expand.

**Framework Organization**

The framework organizes technology outcomes around three interrelated categories.

Foundational Operations, Knowledge and Concepts

Outcomes in this category include understanding the nature and impact of technology, the moral and ethical use of technology, mass media in a digitized context, ergonomic and safety issues, and basic computer, telecommunication and multimedia technology operations.

Processes for Productivity

These outcomes focus on the knowledge and skills required to use a variety of basic productivity techniques and tools. These include text composition, data organization, media and process integration, electronic communication navigation, collaboration through electronic means, and graphical, audio and multimedia composition and manipulation.

Inquiring, Decision Making and Problem Solving

Outcomes in this category build on the foundational operations, knowledge and concepts, as well as the ability to use a variety of processes. These outcomes include the ability to critically assess information, manage inquiry, solve problems and use research techniques. These outcomes should be addressed within the context of other subjects where students are expected to apply their knowledge and skills in practical situations.

**Using the Framework**

Outcomes within the three categories noted above are intended to be:

- integrated into existing programs, through relevant subjects/strands and at appropriate grades/levels
- developed by all students prior to graduation, in a recommended progression from simple to more complex skills.

Schools and school systems are encouraged to use the framework as they plan their CTS programs. The framework assists in identifying technology outcomes relevant to particular CTS strands and courses, and may also be used to plan for:

- improvements to the technological capabilities of schools, including access to learning networks, the Internet, email and bulletin board services
- partnerships among schools, business and the community that facilitate technology implementation
- teacher inservice that focuses on technology competencies and their use in providing instruction
- the acquisition of hardware, productivity software and multimedia resources
- expanded program delivery through communication technology and multimedia courseware.

## TECHNOLOGY INTEGRATION IN CTS

The CTS curriculum integrates technology skills required for daily living, entry-level work and lifelong learning. Each CTS strand requires students to learn about technology and learn with technology.

**Learning About Technology**

While students learn about technology in all CTS strands, the Information Processing, Communication Technology and Electro-Technologies strands provide specific focus on the development of knowledge and skills in information, communication and multimedia technology. Technology outcomes are clearly identified in each of these strands through learner outcomes in each course, and directly support competencies identified in the technology framework within the categories of:

- foundational operations, knowledge and concepts
- processes for productivity.

Information Processing

Refer to the *Information Processing Guide to Standards and Implementation.*

The Information Processing strand provides opportunities for students to learn about electronic technologies as they apply to personal use and the business environment. Students develop competencies related to system operations, text/data input, productivity software, applied processing, dynamic environments and programming.

Communication Technology

Refer to the *Communication Technology Guide to Standards and Implementation*.

The Communication Technology strand provides students with a broad understanding of the impact that presentation and communication technology, print, photography and media design have on society. Students develop competencies related to presentation techniques, photography, print communication and the use of audio, video and digital technologies.

Electro-Technologies

Refer to the *Electro-Technologies Guide to Standards and Implementation*.

The Electro-Technologies strand focuses attention on electric and electronic systems and the role of electronics in daily life, major research and scientific developments. Students develop competencies related to fabrication and service principles, power systems, computer logic systems, and robotic and control systems.

**Learning with Technology**

The CTS curriculum recognizes the expanding influence of technology in all learning environments. CTS students use and apply technology in strand-specific contexts to:

- develop an understanding of difficult concepts and relationships
- perform tasks that are technology-based
- access a range of current information
- collaborate with other learners on a project.

Learning outcomes relevant to the use of technology are embedded throughout the CTS curricula, and reinforce a range of competencies identified in the technology framework—including those within the category of inquiry, decision making and problem solving. Many CTS strands and courses require students to:

- refine and extend their skills in the use of all levels of technology, from simple hand tools to sophisticated computer and telecommunications technologies
- select and manage available technology to respond to challenges
- use information, communication or multimedia technology as an aid to learning.

## STRATEGIES FOR INSTRUCTION IN CTS

Instruction in CTS should use a range of strategies and methodologies that suit the needs of the learner and the nature of learning taking place. No one strategy is appropriate for all courses or learnings within a course, nor for all students. Key to helping students develop career-specific and basic employability skills within the context of any course are:

- flexible time frames for learning
- access to a range of resources and learning activities
- support, encouragement and opportunities for success.

Teachers are encouraged to plan learning experiences that help students:

- understand the outcomes and standards of performance required to succeed in each course
- link theoretical and practical components of learning within each course
- make connections between learning in a particular course, and:
  - what is learned in other CTS strands and curriculum areas
  - future plans for the workplace and/or related post-secondary programs
- become self-directed lifelong learners who are able to adapt to change.

Suggestions for developing a positive CTS learning environment are provided at the end of this section in Chart 3: Positive Classroom Climate Checklist.

**Metric and Nonmetric Measurement**

Many CTS strands and courses involve the development and use of measurement skills. While SI units have become the principal measuring system used in provincial curriculum, the present use of imperial and other nonmetric units in technical and trade-related occupations makes the application of other measurement systems unavoidable. Students should be given opportunities to develop measurement skills consistent with those required in future career paths. Teachers should:

- use SI units of measurement wherever possible in activities
- use imperial and other nonmetric units only where such measurement parallels its common usage in occupations.

## LEARN BY DOING/ACTIVE LEARNING

Active learning occurs when students learn by doing and reflect on the processes used. Active learning requires that students are not just passive recipients of information, but develop the ability to apply what they are learning.

Refer to Appendix 4: Strategies for Instruction in CTS

CTS places an emphasis on learning by doing. Essentially, the teacher's role in this process is that of facilitator, guide and coach. Teachers need to:

- recognize the different ways in which students learn, and plan activities that enable students to use learning processes appropriate to their needs

- plan for deliberate observation and questioning that promote thinking and reflection on learning tasks
- encourage students to observe, verbalize and discuss relationships between theory and practice.

## APPLIED LEARNING/MAKING CONNECTIONS

CTS courses provide career-specific contexts through which students can reinforce, extend and apply learning from other core and optional programs. As students recognize the relevance of prior learning to their future lives, they are motivated to develop higher levels of competency. Course planning should focus attention on ways to help students make connections between abstract concepts developed in other curriculum areas and their application in practical settings.

Refer to Appendix 4: Strategies for Instruction in CTS.

Teachers can enhance students' ability to make connections across the curriculum by:

- increasing their sensitivity to the content of other subject areas and working with other teachers to design courses, lessons and activities that strengthen linkages
- identifying prior learnings in other subject areas that apply in practical CTS contexts and being prepared to review or teach particular core concepts/skills prior to their use in a particular CTS course
- designing projects and assignments that purposely link learnings from one discipline/subject to another and collaborating with other teachers in their delivery to help students integrate learning across several CTS strands or other disciplines
- becoming familiar with the processes used for inquiry, research, reporting and decision making in other disciplines, and providing opportunities for students to use similar processes and vocabulary in CTS settings.

## TEAMWORK/COOPERATIVE LEARNING

The ability to work as part of a team is essential in the workplace. The transition to a technology- and information-based society requires today's workers to pool their expertise. This trend can be expected to become even more pronounced in the future.

Cooperative learning also promotes active learning and encourages individual and group enterprise. Group learning can help students to develop increasingly independent and responsible learning habits and to become more self-disciplined.

CTS offers many opportunities for students to work in team settings, formally and informally. The teacher's role in cooperative learning involves:

Refer to Appendix 4: Strategies for Instruction in CTS

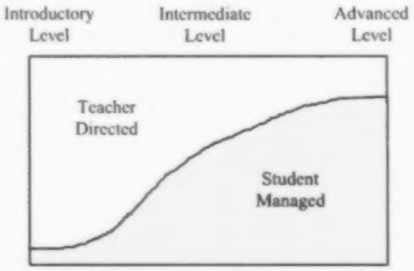
- communicating objectives, assignments and tasks
- determining the size and composition of groups
- arranging for appropriate facilities, equipment and materials
- informing the group of behavioural expectations
- acting as a resource person, coach and monitor
- evaluating the product of the group and performance of each group member.

Teachers may wish to use Form 3: Group Member Effectiveness, included at the end of this section, to guide their observation and evaluation of student performance in group settings.

## MULTI-ACTIVITY LEARNING

Multi-activity learning supports the concurrent delivery of different courses and/or learning tasks within a common time frame. It combines elements of active learning and cooperative learning. The process empowers students, working individually or in groups, to assume responsibility for completing courses or course components within a specified time period.

In multi-activity learning, teacher and student share responsibility for managing the learning process. The process requires students to become self-directed learners who are able to manage their time, energy and resources in effective ways. As students move from introductory to advanced levels and become more proficient in managing their learning, teachers may introduce a larger number of course and activity choices.



Multi-activity learning requires much structure and planning prior to implementation, as well as class time spent in orienting students to expectations and the learning process. The role of the teacher in multi-activity learning is to:

- plan and develop a range of learning activities
- facilitate and support the learning process for individual students or groups of students
- evaluate student performance and learning outcomes.

Teachers and students may wish to use Form 4: Sample Learning Contract, included at the end of this section, in establishing plans for multi-activity learning.

## ASSESSING STUDENT ACHIEVEMENT

### CURRICULUM AND ASSESSMENT STANDARDS

As a competency-based curriculum, CTS defines curriculum standards—what students must know and be able to do, and assessment standards—the criteria and conditions for assessing student performance. Together, the curriculum and assessment standards:

- establish an appropriate level of challenge and rigour for learning within each strand and course
- define knowledge and skills relevant to preparing students for further learning and the workplace
- enable students to focus their efforts on key learnings
- ensure fairness and equity in how student's efforts are judged
- provide a common base of understanding about the competencies developed in each CTS course.

Consistent application of curriculum and assessment standards throughout the learning process is critical to establishing and maintaining the credibility of CTS programs with business, industry, post-secondary institutions and other community stakeholders.

Curriculum and assessment standards are defined in each CTS course through:

- general outcomes (module learner expectations in 1997 documents)—the exit-level competencies that students are expected to achieve to complete a course. Each learner outcome defines and describes critical behaviours that can be measured and observed
- criteria and conditions—the behaviours a student must demonstrate to achieve each exit-level competency and the conditions under which that competency should be judged. The conditions and criteria specify a minimum standard for performance, and include a reference to one or more assessment tools when appropriate
- suggested emphases—guidelines for the relative significance of each general outcome. Though not prescriptive, these guidelines can be used to allocate instructional time and/or determine percentage marks for a course.

Refer to the *CTS Guide to Standards and Implementation*:
- Section D: Introductory Level
- Section E: Intermediate Level
- Section F: Advanced Level.

## ASSESSMENT TOOLS

Refer to the *CTS Guide to Standards and Implementation*, Section G: Assessment Tools.

A range of assessment tools are provided to further assist teachers in assessing student performance in each CTS course. Each assessment tool communicates, through a five-point rating scale, a minimum standard for successfully completing a learning task. When used collectively for a particular course, the assessment tools provide a benchmark for assessing successful course completion in an equitable and consistent manner.

Depending on the way the classroom is organized for instruction, assessment tools may be used with individual students upon completion of specific learning tasks, or with the entire class at the end of a learning period.

Although the assessment tools focus on final or summative assessment, teachers should continue to use formative assessment throughout the learning process as they direct and respond to student efforts. As formative and summative assessment are closely linked, some teachers may find it beneficial to modify the assessment tools provided for particular courses during the instructional process.

**Teachers may develop and use alternative assessment tools providing these tools address standards that are consistent with the minimum competency defined in each course.**

## ASSESSING ACHIEVEMENT IN JUNIOR HIGH SCHOOL

**Assessing Achievement**

**Assessment of student achievement in junior high school is based on successfully demonstrating all or part of the general outcomes for any given course to the minimum standard defined for each competency**. Consistent application of curriculum and assessment standards is critical to maintaining the credibility of student learning in CTS programs.

**Reporting Achievement**

As in other junior high school courses, student achievement is reported to students and parents in accordance with local policy. Reporting practices should provide information to parents about:

- what their child knows and can do in CTS courses
- how well their child is doing in these courses.

At the junior high school level, student achievement is not reported to Alberta Education.

**Tracking Course Completion**

Junior high schools need to implement tracking procedures to maintain appropriate records of the courses and/or general outcomes completed by individual students. Tracking procedures can be:

- quite simple, involving the use of a card for each student to record all completed courses and/or outcomes
- more complex, involving spreadsheets and databases.

Tracking procedures at the school level should be complemented with student portfolios and/or other methods of profiling the work completed by individual students. A per cent mark for completed courses is required by high schools if prior learning is recognized through the granting of credits.

## ASSESSING ACHIEVEMENT IN SENIOR HIGH SCHOOL

**Assessing Achievement**

**Assessment of student achievement in senior high school is based on successfully demonstrating all of the general outcomes for any given course to the standard defined for each competency**. Consistent application of curriculum and assessment standards is critical to maintaining the credibility of student learning in CTS programs.

When a student is able to successfully demonstrate all the general outcomes for any given course to the standard defined for each competency, the teacher designates the course as successfully completed and assigns a percentage grade to the course—a mark not less than 50%.

**Reporting Achievement**

Each high school reports student achievement in CTS courses to the Educational Information Exchange (EIE) on the basis of individual 1-credit courses, using the seven character alphanumeric codes provided on the scope and sequence chart for each CTS strand. Course reporting is done electronically using appropriate file formats, and includes all:

- successfully completed (passed) courses (i.e., courses in which the student has demonstrated all the general outcomes to the established standard), along with a mark of 50% or greater for each successfully completed course
- unsuccessful courses (i.e., courses in which the student has not demonstrated all the general outcomes to the established standard).

Refer to the *Funding Manual for School Authorities in the 1998–1999 School Year.*

CTS courses reported as unsuccessful will need to be further identified regarding their eligibility for funding. For information regarding funding, see the Funding for CTS section below.

For information regarding the reporting of challenged courses and courses completed in junior high school, see the CTS in Senior High School, Effective Transitions section.

As in other senior high school courses, student achievement is reported to students and parents in accordance with local policy.

### Tracking Course Completion

Refer to the *Electronic Data Exchange User Guide* and/or *Manual Forms User Guide.*

Tracking systems used by senior high schools to record the completion of individual CTS courses should align with the system used by EIE for reporting student achievement. Schools may choose to supplement their tracking of course completion with information regarding achievement in junior high school.

Course tracking and record keeping at the senior high school level should be complemented with student portfolios and/or other methods of profiling the competencies and learning experiences of individual students.

## FUNDING FOR CTS

The sources of funding described below support Alberta Education's shift to site-based management. Local school systems are responsible for assessing needs and making appropriate funding applications. School systems also retain responsibility for distributing funds to schools equitably.

### Basic Instructional Funding

Refer to the *Funding Manual for School Authorities in the 1998–1999 School Year.*

Basic instructional funding for junior high schools is independent of course completion. Funding is based on a per student grant, with the amount of the grant subject to adjustment from time to time.

Basic instructional funding for senior high schools is based on the credit enrollment unit (CEU), and allocated according to the following criteria:

- full CEU funding for successfully completed (passed) courses
- 20% of CEU funding for successfully challenged courses.

To be eligible for funding for CTS courses reported as "unsuccessful," a student must have:

- completed at least 50 per cent of the course content, or
- attended at least 50 per cent of the classes in the course.

CEU funding is not provided for high school credits granted upon the recommendations of a junior high school principal.

Further inquiries regarding basic instructional funding should be directed to the School Finance Unit.

### Capital Funding

Refer to the *School Capital Funding Policies, Regulations and Guidelines Manual.*

Capital funds are made available each year for new construction and major modernization projects. This funding is provided to school boards for capital projects that may include the upgrading of an existing CTS lab, construction of new space, and associated equipment costs.

Further inquires regarding capital funding should be directed to the School Facilities Branch.

### Technology Integration Funding

Refer to Alberta Education's web site at <http://ednet.edc.gov.ab.ca/technology/> for funding guidelines.

Funding for technology integration is provided to enable schools to replace obsolete computer systems with new systems that are at, or above, defined standards. Technology integration funding can be applied to the purchase of hardware, instructional software and networking components within schools.

Further inquiries regarding technology integration funding should be directed to the School Technology Task Group, Alberta Education.

## CHART 1: CTS STRANDS THAT REPLACE PRACTICAL ARTS COURSES

Refer to the *Guide to Standards and Implementation*, Section H, for a correlation of CTS courses to former practical arts courses.

| CTS Strand | Practical Arts Courses Replaced by CTS |
|---|---|
| Agriculture | Agriculture: Land and Life 7–8–9<br>Agriculture 10–20–30<br>Horticulture 12–22–32 |
| Career Transitions | no related practical arts course |
| Communication Technology | Industrial Education 7–8–9 (Visual Communication)<br>Graphic Arts 22–32<br>Industrial Education 10–20–30 (Visual Communication)<br>Visual Communication 12–22–32 |
| Community Health | Home Economics 7–8–9 (Family)<br>Health Sciences 12–22–32<br>Personal Living Skills 10–20–30 |
| Construction Technologies | Industrial Education 7–8–9 (Materials)<br>Building Construction 12–22–32<br>Electricity 12–22–32<br>Industrial Education 10–20–30 (Materials)<br>Industrial Education 10–20–30 (Electricity/Electronics) |
| Cosmetology Studies | Beauty Culture 12–22–32 |
| Design Studies | Drafting 10–20<br>Drafting 12–22–32 |
| Electro-Technologies | Electronics 12–22–32<br>Industrial Education 10–20–30 (Electricity/Electronics) |
| Energy and Mines | no related practical arts course |
| Enterprise and Innovation | no related practical arts course |
| Fabrication Studies | Industrial Education 7–8–9 (Materials)<br>Industrial Education 10–20–30 (Materials)<br>Machine Shop 12–22–32<br>Piping 12–22–32<br>Sheet Metal 12–22–32<br>Welding 12–22–32 |
| Fashion Studies | Home Economics 7–8–9 (Clothing)<br>Clothing and Textiles 10–20–30 |
| Financial Management | Recordkeeping 10<br>Business Calculations 20 (Components)<br>Accounting 10–20–30 |

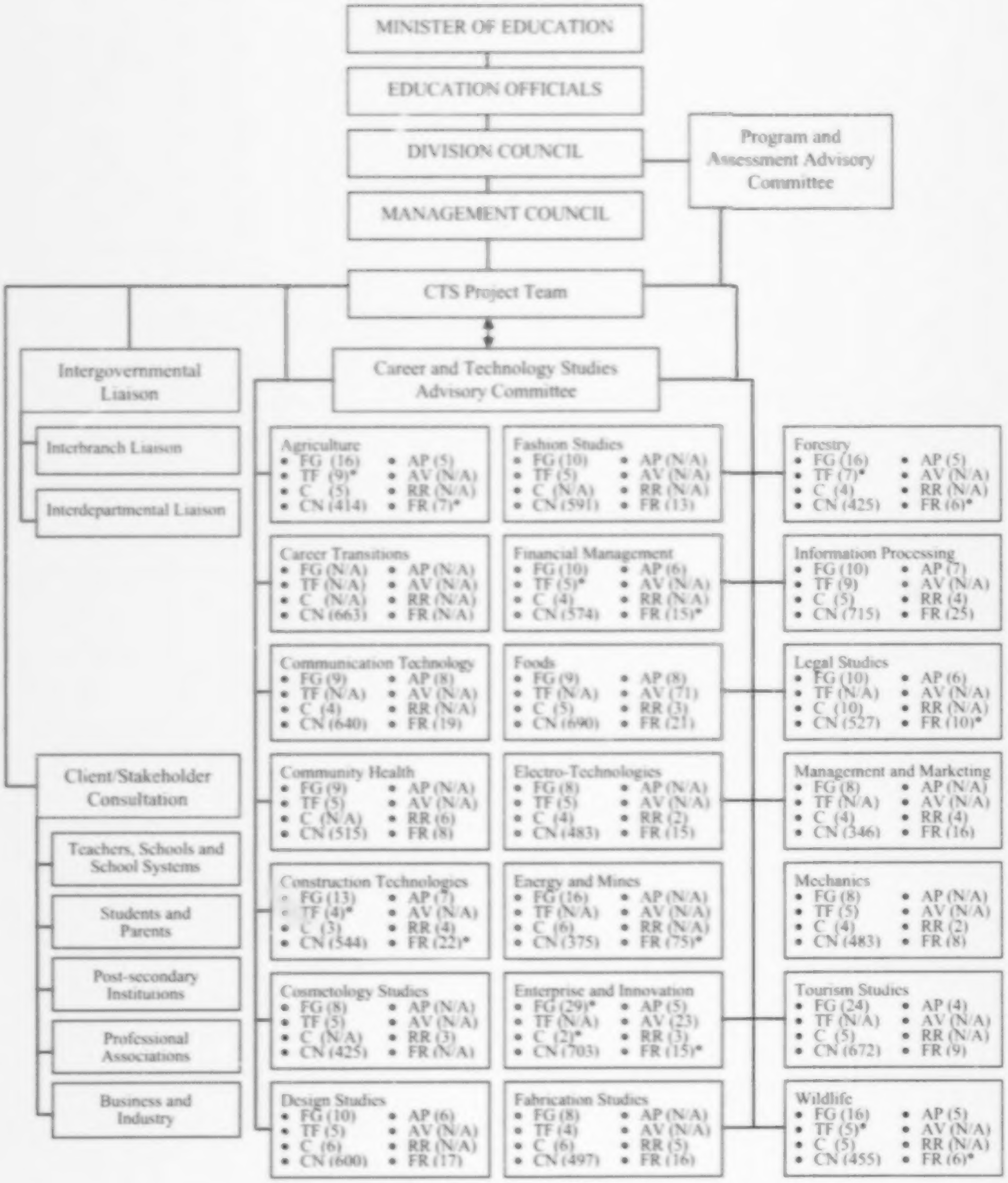
(continued)

(continued)

| CTS Strand | Practical Arts Courses Replaced by CTS |
|---|---|
| Foods | Home Economics 7–8–9 (Foods)<br>Food Preparation 12–22–32<br>Food Studies 10–20–30 |
| Forestry | no related practical arts course |
| Information Processing | Computer Studies 7–8–9<br>Business Calculations 20 (Components)<br>Business Communications 20 (Components)<br>Computer Literacy 10<br>Computer Processing 10–20–30<br>Dicta Typing 20<br>Shorthand 20–30<br>Typewriting 9<br>Typewriting 10–20–30<br>Word Processing |
| Legal Studies | Law 20–30 |
| Logistics | no related practical arts course |
| Management and Marketing | Business Studies 9<br>Basic Business 20–30<br>Marketing 20–30<br>Office Procedures 20–30 (Components)<br>Business Communications 20 (Components)<br>Dicta Typing 20<br>Business Calculations 20 (Components) |
| Mechanics | Industrial Education 7–8–9 (Power)<br>Mechanics 12<br>Automotives 22–32<br>Related Mechanics 22–32<br>Autobody 12–22–32<br>Industrial Education 10–20–30 (Power Technology)<br>Driver and Traffic Safety Education 10 |
| Tourism Studies | no related practical arts course |
| Wildlife | no related practical arts course |

## CHART 2: CTS ADVISORY AND CONSULTATION NETWORK

(as of August 1995)


MINISTER OF EDUCATION
EDUCATION OFFICIALS
DIVISION COUNCIL
Program and Assessment Advisory Committee
MANAGEMENT COUNCIL
CTS Project Team
Intergovernmental Liaison
Interbranch Liaison
Interdepartmental Liaison
Career and Technology Studies Advisory Committee
Client/Stakeholder Consultation
Teachers, Schools and School Systems
Students and Parents
Post-secondary Institutions
Professional Associations
Business and Industry
Agriculture
• FG (16) • AP (5)
• TF (9)* • AV (N/A)
• C (5) • RR (N/A)
• CN (414) • FR (7)*
Career Transitions
• FG (N/A) • AP (N/A)
• TF (N/A) • AV (N/A)
• C (N/A) • RR (N/A)
• CN (663) • FR (N/A)
Communication Technology
• FG (9) • AP (8)
• TF (N/A) • AV (N/A)
• C (4) • RR (N/A)
• CN (640) • FR (19)
Community Health
• FG (9) • AP (N/A)
• TF (5) • AV (N/A)
• C (N/A) • RR (6)
• CN (515) • FR (8)
Construction Technologies
• FG (13) • AP (7)
• TF (4)* • AV (N/A)
• C (3) • RR (4)
• CN (544) • FR (22)*
Cosmetology Studies
• FG (8) • AP (N/A)
• TF (5) • AV (N/A)
• C (N/A) • RR (3)
• CN (425) • FR (N/A)
Design Studies
• FG (10) • AP (6)
• TF (5) • AV (N/A)
• C (6) • RR (N/A)
• CN (600) • FR (17)
Fashion Studies
• FG (10) • AP (N/A)
• TF (5) • AV (N/A)
• C (N/A) • RR (N/A)
• CN (591) • FR (13)
Financial Management
• FG (10) • AP (6)
• TF (5)* • AV (N/A)
• C (4) • RR (N/A)
• CN (574) • FR (15)*
Foods
• FG (9) • AP (8)
• TF (N/A) • AV (71)
• C (5) • RR (3)
• CN (690) • FR (21)
Electro-Technologies
• FG (8) • AP (N/A)
• TF (5) • AV (N/A)
• C (4) • RR (2)
• CN (483) • FR (15)
Energy and Mines
• FG (16) • AP (N/A)
• TF (N/A) • AV (N/A)
• C (6) • RR (N/A)
• CN (375) • FR (75)*
Enterprise and Innovation
• FG (29)* • AP (5)
• TF (N/A) • AV (23)
• C (2)* • RR (3)
• CN (703) • FR (15)*
Fabrication Studies
• FG (8) • AP (N/A)
• TF (4) • AV (N/A)
• C (6) • RR (5)
• CN (497) • FR (16)
Forestry
• FG (16) • AP (5)
• TF (7)* • AV (N/A)
• C (4) • RR (N/A)
• CN (425) • FR (6)*
Information Processing
• FG (10) • AP (7)
• TF (9) • AV (N/A)
• C (5) • RR (4)
• CN (715) • FR (25)
Legal Studies
• FG (10) • AP (6)
• TF (N/A) • AV (N/A)
• C (10) • RR (N/A)
• CN (527) • FR (10)*
Management and Marketing
• FG (8) • AP (N/A)
• TF (N/A) • AV (N/A)
• C (4) • RR (4)
• CN (346) • FR (16)
Mechanics
• FG (8) • AP (N/A)
• TF (5) • AV (N/A)
• C (4) • RR (2)
• CN (483) • FR (8)
Tourism Studies
• FG (24) • AP (4)
• TF (N/A) • AV (N/A)
• C (5) • RR (N/A)
• CN (672) • FR (9)
Wildlife
• FG (16) • AP (5)
• TF (5)* • AV (N/A)
• C (5) • RR (N/A)
• CN (455) • FR (6)*

Key:
FG – Focus Group
TF – Task Force
C – Contractors
CN – Communication Network
AP – Assessment Panel
AV – Assessment Validators
RR – Resource Review
FR – Field Review
( #) – Number of Committee Members
(N/A) – Not Applicable
* – Work Complete

# CHART 3: POSITIVE CLASSROOM CLIMATE CHECKLIST

These classroom management strategies may be used as a basis for establishing a positive classroom climate.

- ☐ Did I greet my students warmly?
- ☐ Are the students aware of the objective for today's activities?
- ☐ Did I help focus the class or individuals on today's activities?
- ☐ Did I review the major concepts from the previous session?
- ☐ Did I explain the purpose of today's lesson or activity clearly and accurately?
- ☐ Did I ask processing questions throughout today's lesson to check for understanding?
- ☐ Did I take five minutes at the end of the class period to allow students to summarize today's learnings?
- ☐ Did I respond to their assigned work in verbal or written form?
- ☐ Did I model all of the classroom ground rules on my own behaviour?
- ☐ Did I consistently enforce the ground rules?
- ☐ Did I consciously try to support the students by focusing on their positive qualities and praising their efforts?
- ☐ Did I handle problems quickly and discreetly, treating my students with respect and fairness?
- ☐ Am I creating a safe, supportive environment in which my students may grow and learn?
- ☐ Am I emphasizing the "specialness" of each individual student, the group as a whole, and the course itself?
- ☐ Am I genuinely encouraging parent and community involvement?

## FORM 1: EVERGREENING CTS—SURVEY AND RESPONSE FORM

# EVERGREENING CTS

## Survey and Response Form

(June 1998)

The purpose of this Survey and Response Form is to gather information and ideas that will:

- enhance initiatives proposed to support the implementation of CTS
- maintain CTS curriculum and resources on an ongoing basis.

Please return your response to Jan Mills, Program Manager, Career and Technology Studies, Curriculum Standards Branch, Alberta Education, 5th Floor East Devonian Building, 11160 Jasper Avenue, Edmonton, AB, T5K 0L2; Telephone 403–422–3275; Fax 403–422–0576, or, email <jmills@edc.gov.ab.ca>.

**Note**: The CTS "modules" are now officially referred to as "courses," each with an individual, alphanumeric code. In this form the term "course" refers to a 1-credit CTS course, and the term "cluster" refers to a multiple-credit CTS offering.

### SECTION A: FOCUS OF RESPONSE

**This response represents:**

☐ suggestions offered by an individual

☐ ideas offered by an individual on behalf of:

____________________________
(organization/group)

☐ the collective ideas offered by:

____________________________
(organization/group)

**Please further describe the focus of this response by checking one of the following:**

☐ Teacher: Grade 7 8 9 10 11 12 (please circle)
☐ Curriculum Leader/Department Head
☐ School Counsellor
☐ School/School System Administrator
☐ Parent/Student
☐ Post-secondary Representative
☐ Business/Industry Representative
☐ Government Representative
☐ Other: ________________________

### SECTION B: IMPLEMENTING CTS

**The following challenges and issues with respect to implementing CTS have been identified through the response received to earlier versions of this survey and response form. Based on your experience in implementing CTS programs, please provide further information regarding the strengths of existing practice and/or recommendations for improvement in each area.**

1. **Junior–Senior High School Transitions**

   a) Feedback suggests that further policies and/or guidelines are required to support transitions for students from junior to senior high school.

   Comments (e.g., current strengths, challenges, recommendations): ____________________

   ________________________________________

   ________________________________________

   b) Schools and/or jurisdictions developing promising strategies to manage junior–senior high school transitions will be identified and encouraged to share their practices.

   Can you identify particular schools and/or jurisdictions that have implemented effective practices?

   ________________________________________

   ________________________________________

(continued)

(continued)

2. **Post-secondary and Workplace Transitions**

   a) Feedback suggests that transitions for CTS students into post-secondary institutions and the workplace could be enhanced through additional articulation agreements; e.g., recognition of CTS for admission to and/or advanced standing in post-secondary programs.

   Comments (e.g., current strengths, challenges, recommendations): ____________

   b) Schools and/or jurisdictions developing promising strategies to manage post-secondary and workplace transitions will be identified and encouraged to share their practices.

   Can you identify particular schools and/or jurisdictions that have implemented effective practices?

3. **Curriculum Content and Rigour**

   a) Feedback suggests that the content, with respect to time requirements, and rigour, level of difficulty, of some CTS courses needs to be reviewed.

   Comments (e.g., current strengths, challenges, recommendations): ____________

   b) Can you identify particular CTS courses in which the content and/or rigour should be reviewed?

   Strand/Course: ____________

   Rationale: ____________

4. **Curriculum Alignment with other Strands/Disciplines**

   a) Feedback suggests that the learnings defined in some CTS courses duplicate learnings that are defined in other strands and/or disciplines; e.g., core, complementary.

   Comments (e.g., current strengths, challenges, recommendations): ____________

   b) Can you identify particular CTS courses that should be reviewed for duplication of learning outcomes?

   Strand/Course: ____________

   Rationale: ____________

5. **Course Sequences/Prerequisites**

   a) Feedback suggests that some course sequences/prerequisites create unnecessary roadblocks or barriers for students, thus reducing opportunities for obtaining advanced level credits for graduation requirements.

   Comments (e.g., current strengths, challenges, recommendations): ____________

   b) Can you identify particular CTS strands/courses whose course sequences/prerequisites should be reviewed?

   Strand/Course: ____________

   Rationale: ____________

(continued)

(continued)

**Can you suggest other initiatives/practices that would enhance effective implementation of CTS?**

## SECTION C: MAINTAINING CTS CURRICULUM AND RESOURCES

The following chart outlines strand-specific recommendations for change to CTS curriculum that have been received from clients and stakeholders over the past year. Each recommendation has been prioritized according to the nature and extent of input received, as:

- **high priority**—similar recommendations were received from a range of stakeholders; these recommendations were supported with a solid rationale and were deemed to require action in 1998–1999
- **medium priority**—limited input was received with respect to particular courses and/or strand-related issues; further input and/or monitoring is required during the coming year prior to taking further action; your comments and input on these recommendations are requested
- **low priority**—no input was received, input was of a minor editorial nature, or the input received was contradictory; no further actions are planned at this time.

**Please respond to recommendations for change within the strands/courses that you have experience, and provide a rationale for the comments you make. Your feedback on recommendations identified as Medium Priority is of particular importance to the evergreening process.**

| Strand | Recommendations | Priority | Comment/Rationale |
|---|---|---|---|
| Agriculture | No input/feedback received | Low | |
| Career Transitions | • determine if there are sufficient courses for skill/technique development, commercial production and client services | High | |
| | • add a three-course sequence on portfolio development | Medium | |
| Communication Technology | • COM1010: Presentation & Communication 1—content duplicates other curriculum | High | |
| | • add additional courses to address career opportunities in the broadcasting/film industry<br>• COM1080: Digital Design 1 is rather general; needs to focus more on multimedia or HTML authoring<br>• add a course on digital photography | Medium | |

(continued)

(continued)

| Strand | Recommendations | Priority | Comment/Rationale |
|---|---|---|---|
| Community Health | • CMH2020: Perspectives on Marriage—should be advanced level course since it is as challenging as CMH3020: Parenting<br>• add advanced level courses on:<br>– control and treatment of disease<br>– biomedical ethics<br>– pediatrics | Medium | |
| Construction Technologies | No input/feedback received | Low | |
| Cosmetology Studies | No input/feedback received | Low | |
| Design Studies | • provide a greater focus/emphasis throughout scope and sequence on computer design | Low | |
| Electro-Technologies | • add an introductory level course on laser technology<br>• reduce number of prerequisite courses<br>• add some advanced level courses | Medium | |
| Energy and Mines | No input/feedback received | Low | |
| Enterprise and Innovation | No input/feedback received | Low | |
| Fabrication Studies | No input/feedback received | Low | |
| Fashion Studies | • add an introductory level and an intermediate level course on quilting techniques<br>• add an advanced level course on flat pattern | Medium | |

(continued)

(continued)

| Strand | Recommendations | Priority | Comment/Rationale |
|---|---|---|---|
| Financial Management | • FIN1010: Financial Information:<br>– is too difficult<br>– is more of a Management and Marketing course<br>– should not be a prerequisite to all other Financial Management courses | Medium | |
| Foods | • FOD2080: Vegetables/Fruits/Grains—is too long—move grains to FOD2090: Creative Cold Foods<br>• FOD2090: Creative Cold Foods is too short | Medium | |
| Forestry | • delete FOR1040/2040: Woods Survival 1 and Wood Survival 2; content duplicates WLD1030/2030: Outdoor Experiences 1 and Outdoor Experiences 2 | High | |
| | • add a three-course sequence on ecoforestry | Medium | |
| Information Processing | • some courses are "too basic" and/or "can be delivered in too short a time"; e.g., 5 hours rather than 25 hours:<br>– INF1010: Computer Operations<br>– INF1090: Information Highway 1<br>• INF1070: Hypermedia Tools—learnings duplicate and are more aligned to the Communication Technology strand/courses<br>• INF3160/3170: Programming Application 2 and Programming Application 3—too advanced in terms of the learner outcome for "solving problems in a second programming language" | High | |
| | • add an advanced level course on spreadsheets and databases | Medium | |
| Legal Studies | • LGS3080: Criminal Law—focus on criminal justice system, but add an intermediate level course to focus on criminal law | Medium | |
| Logistics | No input/feedback received | Low | |

(continued)

(continued)

| Strand | Recommendations | Priority | Comment/Rationale |
|---|---|---|---|
| Management and Marketing | • MAM1010: Management & Marketing Basics—delete the first module learner expectation, as it duplicates the learnings in FIN1010: Financial Information<br>• MAM2020: Promotion: Advertising—too long; split into two, 1-credit courses "Promotion— Print Advertising" and "Promotion— Broadcast Advertising" | High | |
| | • add an introductory course on business ethics or ethics in advertising | Medium | |
| Mechanics | • add a three-course sequence on customer service<br>• add a 1-credit course on bicycle repair and maintenance | Medium | |
| Tourism Studies | • combine TOU1010: The Tourism Industry and TOU1070: The Attractions Sector to eliminate overlap and provide some flexibility | Low | |
| Wildlife | No input/feedback received | Low | |

**Other comments/recommendations for maintaining CTS curriculum and resources:**

____________________

____________________

____________________

____________________

**Can we contact you for further information regarding the views you have shared?**

Your Name: ____________________ Telephone: ____________________

School/Organization: ____________________ Fax: ____________________

Are you interested in:

- reviewing new learning resources? Yes No
- validating new and/or revised courses on an informal basis? Yes No

If yes, please indicate CTS strand(s) ____________________

## FORM 2: CTS COMMUNICATION NETWORK REGISTRATION FORM

If you are interested in becoming a member of the CTS Communication Network, please complete and return this registration form. As a member of the CTS Communication Network, you will receive curriculum updates and newsletters, and may be asked to respond to evergreening initiatives.

***(Please Print)***

Name: ______________________ Date: ______________

Position: ______________________

School/Company/Association: ______________________

Address: ______________________

______________________

______________________

Postal Code: ______________________ Email: ______________

Telephone: ______________________ Fax: ______________

Subjects taught/area of responsibility: ______________________

______________________

Additional information/comments: ______________________

______________________

______________________

Please indicate your area of interest/expertise:

☐ CTS General Information

- ☐ Agriculture
- ☐ Career Transitions
- ☐ Communication Technology
- ☐ Community Health
- ☐ Construction Technologies
- ☐ Cosmetology Studies
- ☐ Design Studies
- ☐ Electro-Technologies
- ☐ Energy and Mines
- ☐ Enterprise and Innovation
- ☐ Fabrication Studies
- ☐ Fashion Studies
- ☐ Financial Management
- ☐ Foods
- ☐ Forestry
- ☐ Information Processing
- ☐ Legal Studies
- ☐ Logistics
- ☐ Management and Marketing
- ☐ Mechanics
- ☐ Tourism Studies
- ☐ Wildlife

Please return to:
Program Manager
Career and Technology Studies
Curriculum Standards Branch
5th Floor East Devonian Building
11160 Jasper Avenue
Edmonton, AB, Canada, T5K 0L2

Fax: 403–422–0576
Telephone: 403–422–3275
Toll Free Inside Alberta 310–0000
Email: <jmills@edc.gov.ab.ca>

# FORM 3: GROUP MEMBER EFFECTIVENESS

**Name**: ______________________ **Date**: ______________________

**Project:** ______________________ **Group:** ______________________

**Observations:** **4** = Always; **3** = Frequently; **2** = Occasionally; **1** = Never

| **Behaviours** | **Observations** | | | |
|---|---|---|---|---|
| **The student:** | 4 | 3 | 2 | 1 |
| was on time | ☐ | ☐ | ☐ | ☐ |
| attended group sessions | ☐ | ☐ | ☐ | ☐ |
| took an active part and contributed information and ideas | ☐ | ☐ | ☐ | ☐ |
| had a positive, rather than negative or critical, approach | ☐ | ☐ | ☐ | ☐ |
| listened when others spoke | ☐ | ☐ | ☐ | ☐ |
| respected and interacted with other members | ☐ | ☐ | ☐ | ☐ |
| respected individual differences | ☐ | ☐ | ☐ | ☐ |
| avoided prejudice and kept biases out | ☐ | ☐ | ☐ | ☐ |
| was open to the ideas and suggestions of others | ☐ | ☐ | ☐ | ☐ |
| encouraged noncontributors to take part | ☐ | ☐ | ☐ | ☐ |
| accepted responsibility for the consequences of his or her behaviour | ☐ | ☐ | ☐ | ☐ |
| was sensitive to the feelings and concerns of others | ☐ | ☐ | ☐ | ☐ |
| was genuine and open | ☐ | ☐ | ☐ | ☐ |
| supported others and helped them articulate their ideas | ☐ | ☐ | ☐ | ☐ |
| helped the group by summarizing, clarifying, mediating, praising and encouraging | ☐ | ☐ | ☐ | ☐ |
| **Strategies for Improvement** | | | | |

## FORM 4: SAMPLE LEARNING CONTRACT

An agreement between a student and a teacher can be used to focus a student's attention on class expectations. This example could be altered as necessary.

Student: ______________________ Date: ______________

Cluster/Course Name: ______________ Teacher: ______________

LEARNER EXPECTATIONS (of cluster/course):

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________

ASSIGNMENTS TO BE SUCCESSFULLY COMPLETED (in order to finish the cluster/course):

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________

PERFORMANCE INDICATORS (specific behaviours necessary for successful completion of the cluster/course):

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________

I understand the requirements for cluster/course completion, and I will complete the learning as noted above.

| | | |
|---|---|---|
| ______________ | ______________ | ______________ |
| Date | Signature of Student | Witnessed by Parent(s) or Guardian |

# CAREER & TECHNOLOGY STUDIES

**Manual for Administrators, Counsellors and Teachers**

## Appendix 1:

# Planning and Marketing CTS in Your School and Community

June 1998

*The information and recommendations provided in this appendix are general in nature and do not in any way replace the collaboration and professional advice required for effective implementation at school and school system levels.*

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## PURPOSE

This appendix provides basic processes and sample support materials to assist school and school system administrators to implement CTS.

Implementation of CTS differs in each school and school system. Effective implementation is based on a commitment from administrators, counsellors and teachers to consider new options in course design and timetabling. CTS provides schools with an opportunity to make connections with other optional or core courses and to design unique programs that meet local needs.

Since each school and school system assumes increasing responsibility for establishing implementation plans in accordance with local needs, it is important to begin the planning process early.

This document outlines eight steps for implementing CTS:

1. Establish a planning team.
2. Draft a plan of action.
3. Inventory resources.
4. Conduct market research about community needs.
5. Identify strands and courses to be offered.
6. Identify potential barriers and possible solutions.
7. Gain commitments for action and secure approvals.
8. Check progress.

Each step is described in detail, often with supporting strategies and questionnaires provided as attachments. Schools and school systems are encouraged to adapt the processes and implementation strategies as required to address local needs and plan for effective implementation.

## STRATEGIES FOR IMPLEMENTING CTS

### 1. ESTABLISH A PLANNING TEAM

The planning team should involve key players from the school and school system including administrators, counsellors and teachers, and students. It may also involve representation from the community, including parents, business and industry, post-secondary and community organizations. Consider the roles and perspectives of key players, in the school and in the community. Some players may be involved only at the initial planning level, while others are responsible for the day-to-day implementation of the plan.

**School-based Members**

Some key players at the school and school system level, and their roles/perspectives, are listed below.

- School and school system administrators promote students' opportunities to move from secondary school to productive, positive adult roles. Administrators help determine which CTS strands/courses are available to students, and are responsible for providing instructional expertise, facilities and resources to deliver selected course sequences in CTS.
- Counsellors provide support for career and occupational guidance and, in many cases, strengthen the link between the goals of the school and those of students and parents.
- Teachers play an essential role in the implementation plan. Teachers from all subject areas should be encouraged to get involved in the planning process. Improved linkages between CTS and other programs, team teaching strategies and shared resources can enrich the learning experience.

**Community-based Members**

Other community members can contribute important perspectives regarding program needs and expanded delivery options through their involvement on planning teams.

- Parents have a vested interest in helping students to maximize their potential.
- Business and industry offer workplace opportunities for students, now and in the future. Members of the business and industry community have expressed the need for highly skilled, effective employees who have a combination of basic competencies and technical and career-specific skills. Many favour an increased involvement in what and how students are taught, and in helping with the delivery of the curriculum. They are valuable assets on the planning team.
- Post-secondary representatives on the planning team ensure coordination of programs and smoother transition between high school and post-secondary programs.
- Community organizations and professional associations are also key players on the CTS planning team, as they can encourage community and professional support for CTS initiatives.

Once a CTS planning team has been established, members should create a vision statement and set goals. It is important that time be allocated for these tasks, but it is also important that once general agreement is reached, the team moves on to preparing the actual implementation plan.

## 2. DRAFT A PLAN OF ACTION

Refer to Attachment 1: Sample Implementation Plan.

Define what is to be achieved (deliverables), when it is to be achieved, and how (responsibilities, resource needs).

### System-level Decision Making

It is important to establish early in the planning stages an understanding of system-level policies and guidelines that affect implementation plans. System level decisions need to be made regarding:

- the degree of flexibility to be delegated to schools
- the depth and breadth of course offerings in CTS
- funding allocations to schools
- the coordination of inservice opportunities
- transitions from junior to senior high, and from senior high to post-secondary and the workplace.

### School-level Decision Making

School-level decisions need to be made, within the system context outlined above, regarding:

- what CTS courses to offer:
  - course combinations
  - cross-strand possibilities
  - advanced level credits for diploma requirements
  - alternative delivery strategies
- how CTS courses will be delivered, keeping in mind:
  - requirements for access to instruction
  - potential strategies for expanding access to CTS courses, in the school and through off-campus learning
  - policies and guidelines regarding assessment
  - a method for tracking course completion
- the counselling structures and practices in place to assist students in making decisions regarding entry into post-secondary programs or the workplace.

Those involved in drafting an implementation plan should take into account that:

- the implementation of new course offerings or delivery strategies should be phased in gradually, taking one step at a time
- expecting too much too fast may lead to problems, stress or even failure
- all players need to be involved in the process and informed of progress on an ongoing basis.

## 3. INVENTORY RESOURCES

**System-level Inventories**

Part of the implementation plan should include consideration of existing and potential resources. Conducting an inventory of resources at the system level can determine:

- existing facilities and equipment
- current and potential off-campus delivery sites
- capabilities/needs with respect to delivering teacher training and inservice in CTS areas
- strategies in place for scheduling classes and grading/reporting student achievement
- policies for the distribution of funds to schools.

**School/Community Profiles**

Refer to:
- Attachment 2: Sample School/Community Profile
- Attachment 3: Sample Community Survey.

Prepare a profile of the school and community, identifying available resources that can be used to meet student needs. Include current and potential physical and human resources available in the school and through off-campus learning. A well-designed school/community profile may be useful in identifying:

- levels of program interest and demand—past student enrollment in the former practical arts courses, current student/parent interest, and potential support from business/industry
- career steps taken by former graduates into the workplace or post-secondary programs
- the courses that students find most useful, and the competencies that young adults wish they had developed while in secondary school
- the competencies that teachers, administrators, parents, community members and business partners consider essential for effective career preparation.

## 4. CONDUCT MARKET RESEARCH ABOUT COMMUNITY NEEDS

Refer to Attachment 4: Sample Student Interest Survey.

Survey student and parent interest in the various CTS strands. The survey may include reference to all the CTS strands, or only those strands that the school can potentially offer. A sample survey is provided for use with students. It can be adapted for use with parents and other community members.

This is a good time to begin summarizing information obtained through previous inventories and surveys, and to consider the implications of this information for course delivery.

## 5. IDENTIFY STRANDS AND COURSES TO BE OFFERED

Refer to Appendix 2: Defining CTS Learning Environments—Strand and Course Parameters.

No one school is expected to offer all the strands and all the courses in CTS. In order to meet the needs of most students, schools need to target certain strands and courses for delivery. It is useful to consider:

- related courses formerly offered through the practical arts
- reasons for offering the present selection of courses
- the views of students and the community regarding the relevancy of current course offerings
- the interests and needs of students and the backgrounds and expertise of school staff
- new strands/courses that could be offered to students if the use of present and potential school- and community-based resources was maximized
- the facility and equipment guidelines for proposed strands/courses
- the instructional qualifications required for offering proposed strands/courses and the inservice requirements of teachers.

## 6. IDENTIFY POTENTIAL BARRIERS AND POSSIBLE SOLUTIONS

The barriers that may affect the implementation of CTS are unique to each school and school system. Barriers may include:

- program credibility within the school and the community—acceptance by community/parents/students of programs that lead to positive career options
- access to resources—teaching expertise, facilities, equipment and instructional materials.

While most CTS courses can likely be implemented through the use of existing labs, program delivery can be expanded through off-campus learning experiences, arrangements with neighbouring schools and/or through distance learning technologies. The involvement of community members in planning course offerings can be an effective strategy in establishing innovative solutions to implementation barriers.

### 7. GAIN COMMITMENTS FOR ACTION AND SECURE APPROVALS

A broad base of support among school and community members is critical to establishing successful implementation practices. It is recommended that approval and commitment for action be obtained from all players, particularly teachers, principals and school system administrators.

Ongoing communication with key players increases local support for actions taken at the school and school system level to implement CTS.

### 8. CHECK PROGRESS

Take time periodically to review the original goals for implementation as outlined in Step 2: Plan of Action. Also review the Sample Implementation Plan as outlined in Attachment 1.

---

## MARKETING CTS IN THE SCHOOL AND COMMUNITY

Schools and school systems are encouraged to design a communication plan to inform all client and stakeholder groups about the goals and structure of the CTS program. The communication plan should include an initial orientation to CTS and ongoing strategies to reinforce and expand understanding of the CTS program and how it is evolving in the school and community.

To assist in communicating information about CTS, information packages can be developed and modified to address the needs of different groups. A number of materials are available for communicating information about CTS within the school and community.

### CTS PROMOTIONAL MATERIALS

Refer to Attachment 5: Blackline Masters—CTS Promotional Materials.

The following information brochures on the CTS program are provided to schools for use as blackline masters:

- *CTS Backgrounder*, 1998
- *CTS Strand Brochure Series*, Revised 1998.

## CTS VIDEOS

The following videos are an effective means of explaining CTS to clients and stakeholders in the school and community:

Source: ACCESS: The Education Station.

- *CTS: Building the Future*, 1996, explains the philosophy, curriculum structure and potential benefits of the CTS program. Designed for viewing by adults, the video is divided into distinct segments and may be used for inservice and orientation sessions. The video is accompanied by a brochure that describes key features of the CTS program (25 minutes).
- *Opportunities for You*, 1996, profiles CTS along with related programs and initiatives. Designed for use with students, the video focuses attention on technical career opportunities, and is accompanied with a questionnaire to assist students in career planning (15 minutes).
- *On Cue*, 1993, introduces teachers, administrators, parents and the community-at-large to the CTS program. The video is divided into distinct segments and may be used for inservice and orientation sessions (30 minutes).
- *U-Choose*, 1993, describes the CTS program and the 22 CTS strands to students (11 minutes).

Attachment 1

## Sample Implementation Plan

**Objective:** **To ensure that all staff involved in the delivery of CTS have received appropriate inservice.**

| ACTION | ASSIGNED TO | START DATE | DATE DUE | DATE COMPLETED |
|---|---|---|---|---|
| 1. Organize a one-day workshop that addresses general and subject-specific topics. | | | | |
| 2. Ensure that course materials and other information available about CTS are distributed to teachers at every opportunity. | | | | |
| 3. Encourage teachers to assess and if necessary upgrade their technical skills to accommodate delivery of CTS courses. | | | | |
| 4. Encourage teachers to assess and if necessary expand their teaching strategies to accommodate delivery of CTS courses. | | | | |
| 5. Establish a network of CTS teachers to ensure ongoing communication on issues relevant to program implementation. | | | | |
| 6. Establish opportunities for ongoing professional development coordinated at the school or school system level, which teachers may access as appropriate. | | | | |
| 7. Ensure that professional development opportunities in CTS align with other initiatives/priorities established at the school or school system level. | | | | |
| 8. Arrange opportunities for teachers to visit other schools that demonstrate innovative approaches to the use of equipment and resources, teaching strategies or school organization. | | | | |

**Objective:** **To establish administrative procedures at the school and school system levels to facilitate the implementation of CTS.**

| ACTION | ASSIGNED TO | START DATE | DATE DUE | DATE COMPLETED |
|---|---|---|---|---|
| 1. Inservice key administrators on program delivery options for CTS. | | | | |
| 2. Investigate alternative models of scheduling. | | | | |
| 3. Schedule CTS courses. | | | | |
| 4. Establish a school-based CTS planning process each fall. | | | | |
| 5. Inventory student interest, staff expertise, and available resources and facilities. | | | | |
| 6. Identify CTS courses to be offered the following school year. | | | | |
| 7. Provide support for teachers who undertake the delivery of new CTS courses. | | | | |
| 8. Devise strategies to support cross-curricular integration between CTS and other subject areas. | | | | |
| 9. Ensure ongoing system coordination of CTS. | | | | |
| 10. Monitor program quality to ensure high standards of teaching/learning. | | | | |
| 11. Market CTS to students and parents at both the school and school system levels. | | | | |

**Objective: To ensure that all necessary human and material resources are in place.**

| ACTION | ASSIGNED TO | START DATE | DATE DUE | DATE COMPLETED |
|---|---|---|---|---|
| 1. Assess the capital equipment necessary for each course prior to implementation. | | | | |
| 2. Determine what purchases will be necessary and budget for these items. | | | | |
| 3. Modify facilities to accommodate each course as required. | | | | |
| 4. Assess the need for new learning resources, including print, audio-visual, computer software and other technologies. | | | | |
| 5. Determine necessary purchases and budget for these items. | | | | |
| 6. Investigate options available to support student-directed learning. | | | | |
| 7. Budget appropriate dollars for the purchase of all necessary materials and supplies. | | | | |
| 8. Develop test banks for all course areas of CTS taught by more than one person. | | | | |
| 9. Maintain knowledge of emerging technologies to ensure related purchases are based on informed decisions. | | | | |
| 10. Ensure that planning for new facilities incorporates current technology and recommended delivery methods. | | | | |

## Sample Indicators of Successful Implementation

| Indicators of Success | 0 | 1 | 2 |
|---|---|---|---|
| 1. CTS implementation in the school (and school system) is guided by a long-range plan. | | | |
| 2. Administrators, counsellors and teachers are knowledgeable about CTS and have incorporated CTS philosophy into the school program. | | | |
| 3. Teachers are engaged in collaborative planning and support program integration. | | | |
| 4. Teachers are enhancing their skills to deliver the CTS program. | | | |
| 5. The school program offers students a choice of CTS strands and supports a wide range of delivery strategies. | | | |
| 6. Facilities are organized for effective learning and instruction. | | | |
| 7. Equipment and resources are available to support delivery of CTS modules. | | | |
| 8. Technology is an integral part of the CTS program and is effectively used by teachers and students. | | | |
| 9. Students are responsible learners and have opportunities for choice in CTS learning activities. | | | |
| 10. Students demonstrate problem-solving and decision-making skills in their CTS learning activities. | | | |
| 11. Student learning activities are appropriate and demonstrate a high standard of achievement. | | | |
| 12. The community is involved as a meaningful partner in the CTS program. | | | |

Rating Scale:

0 No evidence of planning or actions taken at this time.
1 Appropriate planning is underway and first steps have been taken.
2 Effective strategies and practices are in place.

Attachment 2

## Sample School/Community Profile

### A. Student Profile

1. When our students leave school:

_____% enter a university
_____% enter a technical institute
_____% enter a college
_____% enter an apprenticeship program

___% enter a workplace
    ______% retail industry
    ______% tourism industry
    ______% agriculture
    ______% other:________________
    ______% other:________________

2. While students attend our school:

_____% have firm career plans
_____% are planning to go on to post-secondary, but have not decided which area
_____% are undecided about career plans
_____% attend school full-time
_____% work part-time and attend school
_____% work full-time and attend school
_____% actively participate in extracurricular school activities
_____% actively participate in club activities
_____% other:____________________
_____% other:____________________
_____% other:____________________

3. List competencies that students can gain outside of school.

Computer Literacy: ________________________________
Technical Skills: ________________________________
Other: ________________________________________

4. ____% of the school population assesses courses in CTS
____% of the school population assesses courses in other optional areas
____% of the school population assesses courses in Work Experience

5. Among students enrolling in CTS courses, credit enrollments in CTS strands are as follows:

___ Agriculture
___ Career Transitions
___ Communication Technology
___ Community Health
___ Construction Technologies
___ Cosmetology Studies
___ Design Studies
___ Electro-Technologies
___ Energy and Mines
___ Enterprise and Innovation
___ Fabrication Studies
___ Fashion Studies
___ Financial Management
___ Foods
___ Forestry
___ Information Processing
___ Legal Studies
___ Logistics
___ Management and Marketing
___ Mechanics
___ Tourism Studies
___ Wildlife

## B. School Profile

1. Grade level of school:

   ☐ K–12 ☐ 7–12 ☐ 9–12 ☐ 7–9 ☐ 10–12

2. Location of school:

   ☐ Rural ☐ Urban

3. Size of school:

   ☐ Fewer than 300 students (please specify number____________________)
   ☐ 301–800 students
   ☐ 801–1200 students
   ☐ More than 1200 students

4. School population by grade:

   Grade 7 ____________________
   Grade 8 ____________________
   Grade 9 ____________________
   Grade 10 ____________________
   Grade 11 ____________________
   Grade 12 ____________________

5. The student population consists of:

   ☐ Regular students
   ☐ IOP students
   ☐ Special education students
   ☐ Other ________________________

6. What clubs exist in your school?

7. What major productions/projects are undertaken by your school?

8. On what occasions do parents or other community members come to the school?

### *Timetable*

1. Class length and frequency:

Senior high: ____________ minutes per __________
☐ Semestered ☐ Nonsemestered

Junior high:
- core courses: __________________ minutes per ___________
- optional courses: _______________ minutes per ________ ___

2. How are students enrolled in CTS courses?

☐ School placement ☐ Student choice

3. Which CTS strands do you offer?

_______ Agriculture
_______ Career Transitions
_______ Communication Technology
_______ Community Health
_______ Construction Technologies
_______ Cosmetology Studies
_______Design Studies
_______ Electro-Technologies
_______ Energy and Mines
_______ Enterprise and Innovation
_______ Fabrication Studies
_____ Fashion Studies
_____ Financial Management
_____ Foods
_____ Forestry
_____ Information Processing
_____ Legal Studies
_____ Logistics
_____ Management and Marketing
_____ Mechanics
_____ Tourism Studies
_____ Wildlife

4. How many different CTS courses does your school offer? ________________________________

### *Facilities/Equipment*

What facilities/equipment does your school have?

a) Multipurpose labs: ____________________________________________________________
____________________________________________________________

b) Special purpose labs:____________________________________________________________
____________________________________________________________

c) General equipment:____________________________________________________________
____________________________________________________________

d) Strand-specific equipment:____________________________________________________________
____________________________________________________________

e) Other:____________________________________________________________
____________________________________________________________

### *Human Resources*

What CTS-related expertise does your staff have?

a) Formal training: ______________________________

______________________________

b) Hobbies/interests: ______________________________

______________________________

c) Past experience: ______________________________

______________________________

## C. Community Profile

Gather information from local government offices regarding future economic trends and potential employment opportunities. Determine which post-secondary programs are available in your area and gather enrollment statistics. A sample community survey is provided in Attachment 3.

1. Does the school now have any community partnerships; e.g., Work Experience, RAP and/or other off-campus programs?

   ☐ No
   ☐ Yes. If so, please list them:

   ______________________________
   ______________________________
   ______________________________
   ______________________________
   ______________________________

2. How extensive are opportunities for community partnerships?

   ☐ Limited
   ☐ Some
   ☐ Extensive

3. Are community resources and/or expertise incorporated into the school program?

   ☐ No
   ☐ Yes. If so, list them:

   ______________________________
   ______________________________
   ______________________________
   ______________________________
   ______________________________

## Sample Community Survey

Name: ________________________________ Telephone: ________________________

Address: ____________________________________________________________________

Business: ___________________________________________________________________

Check off one or more of the following to indicate how willing you would be to volunteer to help students from ________________________________ learn about your business/organization.
name of school

_____ I will welcome students supervised by a teacher to visit my business/organization for a tour conducted by a responsible member of the business/organization.
**Note**: Arrangements would be made in advance with the classroom teacher.

_____ I am willing to speak directly to a class on the production or process involved in my business, or other area of the industry with which I am familiar. Options include videos, slides, brochures, or other materials in presentations.
**Note**: Arrangements would be made in advance with the classroom teacher.

_____ I am willing to provide information to a teacher by telephone or in person regarding the business/industry that I am involved with.

_____ Our company/organization would be willing to consider forming a partnership with the school or with a program area of the school; e.g., CTS, Humanities, Mathematics, Science, Fine Arts, Physical Education.

_____ Our company/organization would be willing to:
    _____ provide resources
    _____ sponsor students
    _____ other:__________________________________________________

_____ I do not want to be involved.

1. Please identify below the areas of your expertise that you would be willing to share with students.

______________________________________________________________________

______________________________________________________________________

______________________________________________________________________

2. Please provide a brief description of your business/organization along with number of employees.

______________________________________________________________________

______________________________________________________________________

______________________________________________________________________

## Sample Student Interest Survey

You can help your school decide which CTS strands to offer by indicating your preferences in this chart and returning it to your teacher or principal. Your responses will enable your school to determine which strands are of most interest to the students, parents and community.

| CTS Strand | Examples of Related Occupations★ | Very Interested | Somewhat Interested | Not Interested |
|---|---|---|---|---|
| Agriculture | Agriculturalist, Fieldman, Floral Designer, Greenhouse Operator, Writer, Scientist, Farmer, Auctioneer, Cattle Buyer, Landscaper, Horse Trainer, Veterinarian | | | |
| Career Transitions | Supports other strands and supports off-campus learning programs and experiences | | | |
| Communication Technology | Writer, Photographer, Radio/Television Personality, Sales Person, Printer, Desktop Publisher, Journalist, Animator | | | |
| Community Health | Social Worker, Nurse, Dental Assistant, Doctor, Day Care Operator, Physiotherapist, Nursing Home Administrator, Lab Technician | | | |
| Construction Technologies | Engineer, Carpenter, Contractor, Architect, Building Inspector, Draftsman, Instructor, Home Handyman, Electrician, Roofer, Plumber, Estimator, Installer, Millwright | | | |
| Cosmetology Studies | Salon Owner, Hairstylist, Theatrical Makeup Artist, Esthetician, Sales Consultant | | | |
| Design Studies | Architect, Designer, CADD, CAM, Photographer, Engineer, Estimator, Product Designer | | | |
| Electro-Technologies | Engineer, Instructor, Electrician, Computer User, Robotics Engineer, Designer | | | |
| Energy and Mines | Environmentalist, Engineer, Chemist, Mechanic, Technician, Safety Supervisor, Geologist, Service Station Leasee | | | |
| Enterprise and Innovation | Entrepreneur, Fund Raiser, Event Planner, Sales Consultant, Manager, Business Owner, Marketer | | | |
| Fabrication Studies | Millwright, Welder, Iron Worker, Engineer, Technologist, Designer | | | |
| Fashion Studies | Display, Theatre or Fashion Designer, Manufacturing Manager, Retail/Wholesale Buyer, Dressmaker, Tailor | | | |
| Financial Management | Manager, Business Owner, Bookkeeper, Credit/Loans Manager, Accountant | | | |
| Foods | Chef, Dietitian/Nutritionist, Banqueting/Catering Supervisor, Purchasing Manager, Baker, Butcher/Meat Cutter | | | |
| Forestry | Forest Ranger, Environmental Engineer, Biologist, Forest Technologist, Land Surveyor, Logging/Silviculture Worker, Outdoor Guide | | | |
| Information Processing | Word Processor, Administrative Support, Computer Programmer, Office Manager, Systems Analyst | | | |
| Legal Studies | Lawyer, Law Enforcement Officer, Legal Assistant | | | |
| Logistics | Air Traffic Controller, Bus Driver, Letter Carrier, Messenger, Railway Worker, Transportation Worker | | | |
| Management and Marketing | Business Owner, Advertising Consultant, Market Research Analyst, CEO | | | |
| Mechanics | Engineer, Motor/Auto Body Mechanic, Aircraft Mechanic, Heavy Industrial Equipment Operator/Mechanic | | | |
| Tourism Studies | Travel Consultant, Historical Interpreter, Tour Guide, Hotel Manager | | | |
| Wildlife | Fish & Wildlife Officer, Park Ranger, Biologist, Environment Engineer, Veterinarian, Trapper/Hunter, Outdoor Guide | | | |

★While some occupations would be entry level after high school, others may require post-secondary education and/or considerable work experience.

## Blackline Masters—CTS Promotional Materials

CTS Backgrounder

CTS Strand Brochure Series
- Agriculture
- Career Transitions
- Communication Technology
- Community Health
- Construction Technologies
- Cosmetology Studies
- Design Studies
- Electro-Technologies
- Energy and Mines
- Enterprise and Innovation
- Fabrication Studies
- Fashion Studies
- Financial Management
- Foods
- Forestry
- Information Processing
- Legal Studies
- Logistics
- Management and Marketing
- Mechanics
- Tourism Studies
- Wildlife

***CTS helps students make cross-curriculum connections.***

CTS reinforces and expands what students learn in core and other optional secondary programs, including language arts, mathematics, science, fine arts and physical education programs.

Support materials have been developed to assist CTS teachers, as well as other teachers, to identify and reinforce the connections throughout the instructional process.

***CTS helps students build employability skills.***

In each course, CTS students are expected to demonstrate the basic competencies—employability skills—designed to assist them in daily living and in the workplace. These basic competencies include:

- managing learning
- managing resources
- problem solving and innovation
- communicating effectively
- working with others
- demonstrating responsibility.

**FOR FURTHER INFORMATION:**

CTS is on the Internet at <**http://ednet.edc.gov.ab.ca/cts**>. You can:

- review general information
- review curriculum documents
- read about "What's New in CTS."

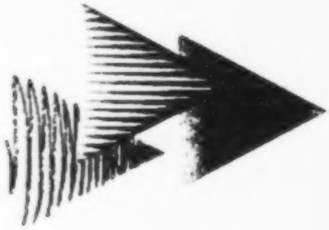
At Alberta Education, contact the Program Manager, Career and Technology Studies, or the Director, Curriculum Standards Branch, at 403–422–4872 or fax 403–422–0576. To be connected toll free outside of Edmonton, dial 310–0000.

School systems/schools, please contact the CTS Program Coordinator for your jurisdiction.

**Note**: Edmonton Telephone Numbers
The long distance area code **403** applies to the above numbers until mid-January 1999.

After mid-January 1999, the long distance area code for Edmonton is **780**.

# Career & Technology Studies



## BACKGROUNDER

1998

Alberta
EDUCATION

## *WHAT IS CTS?*

Career and Technology Studies (CTS) is a program designed to help Alberta students:

- develop skills they can apply in daily living now and in the future
- make effective career choices
- prepare for entry into the workplace or further learning opportunities.

As of September 1997, CTS replaced all junior and senior high school practical arts courses—business education, home economics, industrial education. This optional program affects all junior and senior high schools in Alberta (over 740). CTS was phased in beginning in 1992.

Over 2400 Albertans, teachers, post-secondary institutions, business and professional groups and other government departments, have been involved in the development of this curriculum. The CTS curriculum is also offered in some adult learning environments and is being considered for use in other provinces and countries.

The CTS curriculum structure is different from other courses, allowing schools more opportunity to design programs that are relevant to student needs and make more efficient use of school and community resources.

CTS is organized into ***strands*** and ***courses***. A ***strand*** is a group of courses designed to support broad career and occupational opportunities. A ***course*** defines what the student is expected to know and be able to do. Most students take 25 hours to complete each course, although some students need more or less time. At the senior high school level, one course, successfully completed, equals one credit.

CTS consists of 22 strands, with a total of 660 courses, which are available to junior and senior high schools across Alberta.

| **CTS Strands** | **No. of Courses** |
|---|---|
| Agriculture | 33 |
| Career Transitions | 28 |
| Communication Technology | 33 |
| Community Health | 31 |
| Construction Technologies | 46 |
| Cosmetology Studies | 58 |
| Design Studies | 31 |
| Electro-Technologies | 37 |
| Energy and Mines | 26 |
| Enterprise and Innovation | 08 |
| Fabrication Studies | 41 |
| Fashion Studies | 29 |
| Financial Management | 14 |
| Foods | 37 |
| Forestry | 21 |
| Information Processing | 48 |
| Legal Studies | 13 |
| Logistics | 12 |
| Management and Marketing | 19 |
| Mechanics | 54 |
| Tourism Studies | 24 |
| Wildlife | 17 |

The curriculum is competency based and recognizes prior learning both from formal schooling and community or personal initiatives. Standards for each of the courses are clearly specified and rigorous.

Senior high school transcripts report only those CTS courses that students have completed successfully.

## *WHO TAKES CTS?*

Based on previous enrollment patterns, it is anticipated that:

- most students obtaining a senior high school diploma complete a minimum of 3 credits in CTS; *and of these*
- approximately 75 per cent will earn at least 30 credits in CTS.

## *HOW DOES CTS AFFECT STUDENT LEARNING?*

***CTS improves student transitions into the workplace and post-secondary programs.***

One of the key goals in CTS is to improve student transitions into the workplace and into related post-secondary programs. Some progress has already been made with selected post-secondary institutions in recognizing CTS for preferred entrance or advanced credit. For example, students who complete the two soils courses in the CTS Agriculture strand receive credit for Soils 101 at Olds College.

In addition, some credentials and certificates recognized by professional groups and in the workplace can also be obtained through CTS. For example, St. John Ambulance Certificate for First Aid can be obtained through the CTS Community Health strand. CTS programs also encourage a variety of delivery approaches, including off-campus programs and workplace learning.

### *What ELSE do I need to know?*

CTS Agriculture courses strongly support what you learn in:
- Biology
- Chemistry
- Social Studies
- CTS Construction Technologies
- CTS Design Studies
- CTS Enterprise and Innovation
- CTS Fabrication Studies
- CTS Foods
- CTS Forestry
- CTS Mechanics
- CTS Wildlife.

**FOR FURTHER INFORMATION ABOUT CTS:**

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# Career and Technology Studies

## AGRICULTURE

(Revised 1998)

Alberta
EDUCATION

## *WHAT'S it all ABOUT?*

Agriculture is the second largest industry in Alberta. Most of us think of it as farming, but any farmer can tell you it's much bigger than that.

The CTS Agriculture strand provides an opportunity for you to explore:

- animal production
- field, nursery and greenhouse plant production
- the agrifood industry
- animal care
- floral design
- interior and exterior plantscape
- soils management and conservation
- market research and development
- environmental management.

## *What will I LEARN in Agriculture?*

At the introductory level, you study:

- the agriculture industry in Alberta
- basics of agricultural production
- marketing fundamentals in the Canadian context
- an overview of agricultural technology
- resource management and conservation.

At the intermediate and advanced levels, you study:

- agriculture in the global economy
- emerging technologies
- environmental sustainability
- specialized knowledge and skills in particular areas of interest.

## *Agriculture Courses*

**Introductory**
- Agriculture: The Big Picture
- Production Basics
- Consumer Products & Services
- Basic Landscape/Turf Care
- Basic Floral Design
- Market Fundamentals
- Agriculture Technology
- Resource Management

**Intermediate**
- Animal Husbandry/Welfare
- Field Crops 1 (Materials & Processes)
- Nursery/Greenhouse Crops 1 (Materials & Processes)
- Livestock/Poultry 1 (Materials & Processes)
- Equine 1 (Materials & Processes)
- Agrifoods 1 (Materials & Processes)
- Landscape/Turf Management 1 (Maintenance Practices)
- Floral Design 1 (Projects for All Occasions)
- Marketing 1 (Open Marketing Structures)
- Protected Structures
- Soils Management 1 (Soil Properties/Classification)
- Integrated Pest Management

**Advanced**
- Issues in Agriculture
- Field Crops 2 (Management Techniques)
- Nursery/Greenhouse Crops 2 (Management Techniques)
- Livestock/Poultry 2 (Management Techniques)
- Equine 2 (Management Techniques)
- Agrifoods 2 (Standards & Regulation)
- Landscape/Turf Management 2 (Installation & Repair)
- Floral Design 2 (Creative Design & Display)
- Marketing 2 (Closed Marketing Structures)
- Biotechnology
- Water Management
- Soils Management 2 (Soil Testing & Amending)
- Sustainable Agriculture Systems

## *WHERE can this TAKE me?*

**Jobs!** As the second largest industry in Alberta, agriculture creates a broad range of employment options. Over 80 potential careers have been identified, including:

- engineers
- farmers and farm managers
- greenhouse/nursery operators
- land surveyors
- landscape architects
- mechanics
- researchers
- pet groomers
- veterinarians.

**Post-secondary Education!** About two-thirds of the careers in agriculture require some form of post-secondary education. In Alberta, almost every college and university offers programs in agriculture.

In addition, you may be eligible to apply for either credits or advanced standing in some post-secondary programs.

See your counsellor for more information.

## *What ELSE do I need to know?*

Because of its emphasis on practical employment skills, Career Transitions supports your entire high school experience.

This CTS strand is linked to what you learn in:

- Personal Development
- Social Studies
- all other CTS strands.

**FOR FURTHER INFORMATION ABOUT CTS:**

- visit our home page on the Internet to review general information, review curriculum documents, or read about "What's New in CTS" at **<http://ednet.edc.gov.ab.ca/cts>**
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# Career and Technology Studies

Opportunity
Options!

## CAREER TRANSITIONS

(Revised 1998)

Alberta
EDUCATION

## *WHAT'S it all ABOUT?*

Choosing what you want to do after high school, and knowing how to achieve that goal, can be challenging. The Career Transitions strand gives you the skills you need to make critical decisions as you move toward graduation. It helps you:

- develop decision-making skills
- recognize the value of the knowledge and skills you already possess
- set realistic career goals
- understand the expectations of employers
- prepare for the experience of finding a job.

## *What will I LEARN in Career Transitions?*

You learn about:

- the job market and employment trends
- selected occupations
- good work habits
- resume writing
- interview skills
- project design and management
- leadership principles and practices
- personal and workplace safety.

## *Career Transitions Courses*

**Introductory**

- Job Preparation
- Leading by Example
- Project 1A and 1B
- Personal Safety (Management)

**Intermediate**

- Job Maintenance
- Taking the Lead
- Governance & Leadership
- Project 2A, 2B, 2C, 2D and 2E
- Workplace Safety (Practices)

**Advanced**

- Preparing for Change
- Organizational Leadership
- Leading for Change
- Project 3A, 3B, 3C, 3D and 3E
- Practicum A, B, C, D and E
- Safety Management Systems

## *WHERE can this TAKE me?*

Career Transitions provides knowledge and skills that can be of value no matter what career you choose. It provides essential job search and employment skills that can be used throughout your work life.

You may be able to use some of the Career Transitions courses to gain certificates in First Aid and Job Safety Skills.

See your counsellor for more information.

## *What ELSE do I need to know?*

Courses that support what you learn in Community Health are:

- Biology
- Health and/or Personal Development
- Language Arts
- Science
- Social Studies
- CTS Career Transitions
- CTS Design Studies
- CTS Foods
- CTS Information Processing.

**FOR FURTHER INFORMATION ABOUT CTS:**

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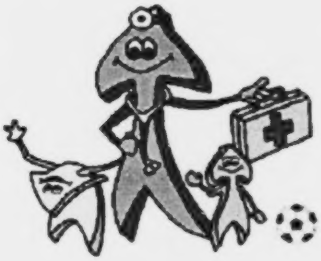
# Career and Technology Studies



## COMMUNITY HEALTH

(Revised 1998)

Alberta
EDUCATION

## *WHAT'S it all ABOUT?*

The World Health Organization defines health as "a state of physical, mental and social well-being and not merely the absence of disease or infirmity." Good health is more than personal wellness and self-discipline. It involves getting along with others, a personal state of control, the ability to cope with stress, minimizing health risks, and supporting meaningful work, as well as a clean, safe environment.

The 21st century will see new medical technology and new ideas and directions in health care. Shifts in the economy, social behaviours and expectations, and changes in technology and communication present opportunities and challenges for individuals, families and communities. In the CTS Community Health strand, you can explore these challenges. You can:

- review the social, physical, economic and cultural conditions that affect the wellness of individuals, families and communities
- become a knowledgeable and responsible health consumer
- explore healthy lifestyles.

## *What will I LEARN in Community Health?*

You can choose from modules on:

- family dynamics
- adolescent health issues
- community volunteerism
- caring for children
- home care or day care
- prenatal and postnatal care
- anatomy, physiology and pathology
- mental health
- first aid and sports first aid.

## *Community Health Courses*

**Introductory**

- Family Dynamics
- Caring for Children
- Child Development
- Home Care 1
- Perspectives on Health
- Personal Safety (Management)

**Intermediate**

- Adolescent Health Issues
- Perspectives on Marriage
- Community Volunteerism
- Day Care 1
- Home Care 2 (Personal Care Services)
- Sensory Challenges
- Respiratory System
- Circulatory System
- Musculoskeletal System
- Complementary Therapies
- First Aid/CPR
- Sports First Aid 1

**Advanced**

- Family Issues
- Parenting
- Aging
- Prenatal & Postnatal Care
- Day Care 2
- Home Care 3 (Special Conditions)
- Challenged Individuals
- Digestive System
- Nervous/Endocrine Systems
- Mental Health
- Advances in Medical Technology
- First Aid/CPR for Children
- Sports First Aid 2

## *WHERE can this TAKE me?*

Community health careers are expected to be strong areas of job growth in the next decade. The range of possible occupations is large, and includes:

- child care workers
- family counsellors
- doctors and nurses
- emergency response technicians
- medical technologists
- nutritionists
- public health nurses
- sports medicine technicians.

**Post-secondary Education!** Almost every post-secondary institution in Alberta offers health and health-related courses.

In addition, Community Health courses can be used to learn skills recognized by St. John Ambulance, the Canadian Red Cross, the Alberta Sports Medicine Council, and Alberta Family and Social Services.

See your counsellor for more information.

## *What ELSE do I need to know?*

CTS Communication Technology courses strongly support what you learn in:
- Fine Arts
- Language Arts
- Social Studies
- CTS Design Studies
- CTS Enterprise and Innovation
- CTS Information Processing.

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After mid-January 1999, the long distance area code is **780**.

# Career and Technology Studies

## COMMUNICATION TECHNOLOGY
(Revised 1998)

Alberta
EDUCATION

## *WHAT'S it all ABOUT?*

The information age of the 21st century requires effective communication, using a variety of media. Communication Technology can provide you with a broad awareness of the impact that presentation and communication technology, print, photography, and media design and application have in every aspect of your lives.

The CTS Communication Technology strand provides an opportunity for you to explore:

- presentation techniques
- photography
- print communication
- audio/video/digital.

## *What will I LEARN in Communication Technology?*

At the introductory level, you study:

- presentation and communication
- photography
- printing
- audio/video production
- animation
- digital design.

At the intermediate and advanced levels, you study:

- media design and analysis
- script writing
- photojournalism.

## *Communication Technology Courses*

**Introductory**

- Presentation & Communication 1
- Media & You
- Photography 1
- Printing 1
- Audio/Video Production 1
- Animation 1
- Digital Design 1

**Intermediate**

- Presentation & Communication 2
- Media Design & Analysis 1
- Script Writing 1
- Photography 2
- Photographic Communication
- Photographic Techniques 1
- Special Effects Photography
- Printing Techniques 1
- Printing Applications 1
- Audio/Video 1 and 2
- Animation 2
- Digital Design 2

**Advanced**

- Presentation & Communication 3
- Media Design & Analysis 2
- Script Writing 2
- Photography 3
- Photojournalism
- Photographic Techniques 2
- Colour Photography
- Printing Techniques 2
- Printing Applications 2
- Audio 3
- Video 3
- Animation 3
- Digital Design 3

## *WHERE can this TAKE me?*

The knowledge and skills gained from studying communication technology can be used in a variety of career fields and numerous post-secondary education choices. These skills give students an edge in presenting their views and ideas, in understanding others and in completing projects. The areas most affected by communication technology include:

- animation
- graphic design
- journalism
- photography
- radio and television arts.

## *What ELSE do I need to know?*

CTS Construction Technologies courses strongly support what you learn in:

- Language Arts
- Mathematics
- Science
- Social Studies
- CTS Agriculture
- CTS Career Transitions
- CTS Design Studies
- CTS Electro-Technologies
- CTS Enterprise and Innovation
- CTS Fabrication Studies
- CTS Forestry
- CTS Logistics.

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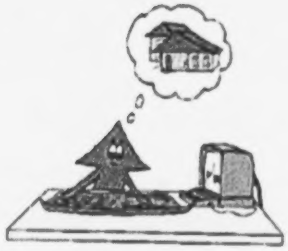
# Career and Technology Studies



## CONSTRUCTION TECHNOLOGIES

(Revised 1998)

Alberta
EDUCATION

## *WHAT'S it all ABOUT?*

In recent years, dramatic changes have occurred in the way buildings and other products are designed and constructed. With the aid of computers, architects and engineers are able to simulate and evaluate designs with extreme accuracy. This means stronger structures, less waste and the need for a highly trained work force. The Construction Technologies strand has been developed to help meet this need.

The CTS Construction Technologies strand provides an opportunity for you to explore:

- building systems, processes and applications
- materials and tools
- design and construction of buildings and durable goods
- standards of quality production and service
- manufacturing systems, processes and applications
- health, safety and environmental issues
- codes for building construction and manufacturing activities.

## *What will I LEARN in Construction Technologies?*

At the introductory level, you study:

- construction and fabrication processes
- project planning and management
- solid stock construction
- turning operations.

At the intermediate and advanced levels, you study:

- site preparation
- concrete work
- energy-efficient housing design
- commercial structures, furniture and cabinet making
- production management.

## *Construction Technologies Courses*

**Introductory**
- Basic Tools & Materials
- Building Construction
- Project Management
- Solid Stock Construction
- Turning Operations
- Manufactured Materials
- Mold Making & Casting

**Intermediate**
- Site Preparation
- Concrete Forming
- Alternative Foundations
- Framing Systems 1 (Floor & Wall)
- Roof Structures 1 (Framing & Finishing)
- Exterior Finishing (Door, Window & Siding)
- Electrical Systems
- Plumbing Systems
- Climate Control Systems
- Agri-structures
- Multiple Materials
- Furniture Making 1 (Box Construction)
- Furniture Making 2 (Frame & Panel)
- Finishing & Refinishing
- Cabinetmaking 1 (Web & Face Frame)
- Cabinetmaking 2 (Door & Drawer)
- Wood Forming
- Manufacturing Systems
- Product Development

**Advanced**
- Concrete Work (Structures & Finishes)
- Masonry Work (Structures & Finishes)
- Framing Systems 2 (Floor, Wall & Ceiling)
- Stair Construction
- Roof Structures 2 (Framing & Covering)
- Wall & Ceiling Finishing
- Doors & Trim
- Floorcovering
- Energy-efficient Housing
- Renovations/Restorations
- Commercial Structures
- Site Management
- Tool Maintenance
- Furniture Making 3 (Leg & Rail)
- Furniture Making 4 (Surface Enhancement)

**Advanced** (continued)
- Furniture Repair
- Cabinetmaking 3 (Cabinets/Countertops)
- Cabinetmaking 4 (Layout & Installation)
- Production Planning
- Production Management

## *WHERE can this TAKE me?*

Knowledge and skills developed in the Construction Technologies strand enable students to move into more than 30 occupations requiring high school or trades education. These include:

- cabinetmakers
- construction estimators
- construction inspectors
- construction managers
- carpenters
- elevator contractors
- painters and decorators
- plumbers
- renovators
- residential home builders.

**Post-secondary Education!** Many careers in construction technologies require some form of post-secondary education. In Alberta, numerous public, private and vocational colleges offer apprenticeship programs in this area.

In addition, you may be eligible to apply for either credits or advanced standing in some post-secondary programs.

See your counsellor for more information.

## *What ELSE do I need to know?*

The CTS Cosmetology Studies strand has links to the following courses:

- Chemistry
- Personal Development
- Social Studies
- Registered Apprenticeship Program
- CTS Career Transitions
- CTS Design Studies
- CTS Enterprise and Innovation.

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# Career and Technology Studies

## COSMETOLOGY STUDIES

(Revised 1998)

Alberta
EDUCATION

## *WHAT'S it all ABOUT?*

Personal appearance is important in every culture. It reflects society and how we see ourselves in it. Cosmetology—hair, makeup, and general grooming—is a large part of the huge fashion industry, and is a supporting player in the entertainment industry as well. The CTS Cosmetology Studies strand offers instruction and experience in personal and professional body care and grooming practices.

## *What will I LEARN in Cosmetology Studies?*

This strand provides basic and career-specific skills that enable you to choose between employment opportunities or post-secondary cosmetology-related studies.

Specific skills include:
- hair care
- skin care
- manicuring
- theatrical makeup
- cosmetics and design
- business management.

## *Cosmetology Studies Courses*

**Introductory**
- Personal Images
- Hair Graphics 1
- Hair & Scalp Care 1
- Forming & Finishing 1
- Permanent Waving 1 (The Physical Process)
- Skin Care 1 (Basic Practices)
- Manicuring 1
- Theatrical Makeup 1 (Basic Principles)

**Intermediate**
- Hair Graphics 2
- Hair & Scalp Care 2
- Forming & Finishing 2
- Haircutting 1
- Hair Care & Cutting 1 (Client Services)
- Permanent Waving 2 (Cold Waving)
- Permanent Waving 3 (Heat-assisted)
- Permanent Waving 4 (Client Services)
- Colouring 1
- Colour Removal 1
- Colouring & Removal 1 (Client Services)
- Facials & Makeup 1
- Facials & Makeup 2 (Client Services)
- Skin Care 2 (Client Services)
- Manicuring 2
- Nail Art
- Manicuring 3 (Client Services)
- Hairpieces & Extensions
- Theatrical Makeup 2 (Planning the Images)
- Historical Cosmetology
- Sales & Service 1 (Principles & Practices)

**Advanced**
- Professional Practices
- Long Hair Graphics
- Hair & Scalp Care 3
- Hair & Scalp Care 4 (Client Services)
- Haircutting 2
- Haircutting 3 (Client Services)
- Hair Care & Cutting 2 (Client Services)
- Permanent Waving 5 (Designer)
- Relax/Straighten Hair
- Wave, Relax & Straighten Hair (Client Services)
- Colouring 2 (Permanent)

**Advanced** (continued)
- Colour Removal 2
- Colouring & Removal 2 (Client Services)
- Body Therapy
- Hair Removal
- Skin Care 3 (Client Services)
- Male Facial Grooming 1
- Male Facial Grooming 2 (Client Services)
- Nail Technology
- Pedicuring
- Nail Care (Client Services)
- Wigs & Toupees
- Hair Goods (Client Services)
- Theatrical Makeup 3 (Changing Images)
- Theatrical Makeup 4 (Client Services)
- Facial & Body Adornment
- Creative Cosmetology
- Sales & Service 2 (Effectiveness)
- Competition Cosmetology

## *WHERE can this TAKE me?*

There will always be demand for cosmetology services in society. This is an exciting field to explore, if you enjoy personal service, would like to own your own business, or are interested in fashion or design. Some of the potential careers are:
- electrologists
- hair stylists
- makeup artists
- theatrical makeup artists.

**Post-secondary Education!** Many careers in cosmetology studies require some form of post-secondary education. In Alberta, numerous public, private and vocational colleges offer apprenticeship programs in this area.

In addition, you may be eligible to apply for either credits or advanced standing in some post-secondary programs.

See your counsellor for more information.

## *What ELSE do I need to know?*

The notion of design can be found in:

- Art
- Drama
- Science
- CTS Communication Technology
- CTS Construction Technologies
- CTS Enterprise and Innovation
- CTS Fabrication Studies
- CTS Fashion Studies
- CTS Management and Marketing.

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# Career and Technology Studies

## DESIGN STUDIES

(Revised 1998)

Alberta
EDUCATION

## *WHAT'S it all ABOUT?*

Design surrounds us. Everyone designs every day. Signs, displays, packages, road systems, computer games, furniture, automobiles, clothing, banquets, houses and highrises are all examples of professional design. CTS Design Studies helps you become aware of design in your environment. You solve visual, structural and organizational problems and apply your skills and knowledge to create innovative approaches, products and systems.

The CTS Design Studies strand provides an opportunity for you to explore:

- creativity and aesthetics
- processes
- resources
- communication
- project management
- the business and profession of design.

## *What will I LEARN in Design Studies?*

At the introductory level, you study:

- sketching, drawing and modelling
- the design process
- two-dimensional design
- three-dimensional design
- computer-aided design.

At the intermediate and advanced levels, you study:

- technical drawing/drafting
- design history
- skills to create a specialized design portfolio in your area of interest.

## *Design Studies Courses*

**Introductory**

- Sketch, Draw & Model
- The Design Process
- 2-D and 3-D Design Fundamentals
- CAD Fundamentals (Computer-aided Design)
- Drafting/Design Fundamentals

**Intermediate**

- 2-D and 3-D Design Applications
- CAD Applications (Computer-aided Design)
- Drafting/Design Applications
- Technical Drawing Applications
- The Evolution of Design

**Advanced**

- 2-D Design Studio 1, 2 and 3
- 3-D Design Studio 1, 2 and 3
- Living Environment Studio 1, 2 and 3
- CAD Modelling Studio (Computer-aided Design)
- Drafting/Design Studio 1, 2 and 3
- Technical Drawing Studio 1, 2 and 3
- Visualizing the Future
- The Design Profession
- Portfolio Presentation

## *WHERE can this TAKE me?*

The ability to solve many different kinds of design challenges creates a broad range of employment options. Potential careers include:

- architects
- draftsmen
- engineers
- exhibition/display designers
- fashion designers
- furniture designers
- graphic designers
- industrial (product) designers
- interior designers
- landscape designers
- set designers.

**Post-secondary Education!** Development of marketable skills in design requires post-secondary training. All universities in Alberta and most colleges and technical institutes offer programs in various areas of design.

See your counsellor for more information.

## *What ELSE do I need to know?*

CTS Electro-Technologies courses strongly support what you learn in:

- Drama
- Language Arts
- Mathematics
- Physics
- Science
- CTS Career Transitions
- CTS Community Health
- CTS Construction Technologies
- CTS Design Studies
- CTS Enterprise and Innovation
- CTS Fabrication Studies
- CTS Information Processing
- CTS Mechanics.

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# Career and Technology Studies

## ELECTRO-TECHNOLOGIES

(Revised 1998)

Alberta
EDUCATION

## *WHAT'S it all ABOUT?*

In a rapidly changing and expanding technological world, we are constantly surrounded by an increasing number of electric and electronic systems. These systems play a significant role in our day-to-day lives, and in the success of major research and development in science.

The CTS Electro-Technologies strand provides an opportunity for you to explore:

- fabrication and service principles
- power systems
- computer logic systems
- communication systems
- robotic and control systems.

## *What will I LEARN in Electro-Technologies?*

At the introductory level, you study:

- electro-assembly
- electronic power supply
- logic principles
- analog communication.

At the intermediate and advanced levels, you study:

- branch circuit wiring
- digital technology
- radio frequency communication
- magnetic control devices
- power generation and transformation
- microprocessor interfacing applications
- robotics.

## *Electro-Technologies Courses*

**Introductory**

- Electro-assembly 1
- Conversion & Distribution
- Electronic Power Supply 1
- Digital Technology 1
- Control Systems 1
- Analog Communication 1
- Electronic Communication
- Security Systems 1
- Robotics 1

**Intermediate**

- Electro-assembly 2
- Electrical Servicing
- Branch Circuit Wiring
- Electronic Power Supply 2
- Digital Technology 2
- Computer Technology
- Control Systems 2
- Analog Communication 2
- Radio Communication
- Security Systems 2
- Electro-optics
- Magnetic Control Devices
- Robotics 2
- Electronic Controls

**Advanced**

- Electro-assembly 3
- Electronic Servicing
- Power Systems & Services
- Generation/Transformation
- Digital Technology 3
- Digital Applications
- Microprocessors
- Microprocessor Interface
- Analog Communication 3
- Amplifiers
- Data/Telemetry Systems
- Motors
- Robotics 3
- Control Applications

## *WHERE can this TAKE me?*

The CTS Electro-Technologies strand offers you skills and knowledge in electronics and electrical applications, including fabrication or servicing of electronic equipment, house wiring, use of remote control devices and programming of robots. You will be introduced to a wide variety of occupations in this field, including:

- audio and video recording technicians
- avionics technicians
- broadcast technicians
- communication electricians
- electrical and electronic engineers
- electrical products manufacturing supervisors
- fibre optics technicians
- laser technicians
- power system electricians
- utilities managers.

**Post-secondary Education!** Many careers in electro-technologies require some form of post-secondary education. In Alberta, numerous public, private and vocational colleges offer apprenticeship programs in this area.

In addition, you may be eligible to apply for either credits or advanced standing in some post-secondary programs.

See your counsellor for more information.

## *What ELSE do I need to know?*

CTS Energy and Mines courses strongly support what you learn in:

- Chemistry
- Physics
- Science
- CTS Agriculture
- CTS Construction Technologies
- CTS Design Studies
- CTS Fabrication Studies
- CTS Legal Studies
- CTS Management and Marketing
- CTS Wildlife.

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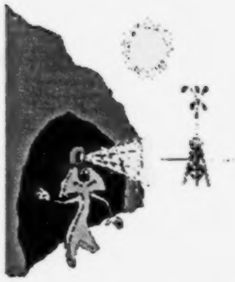
# Career and Technology Studies



## ENERGY AND MINES

(Revised 1998)

Alberta
EDUCATION

## *WHAT'S it all ABOUT?*

Alberta is richly endowed with oil, gas, oil sands, heavy oil and coal, and these resources are, and will continue to be, major contributors to our province's economy. Mineral development for industrial applications has significant effects on Alberta's economy as well.

The CTS Energy and Mines strand provides an opportunity for you to explore:
- exploration
- recovery and production
- refining and manufacturing
- marketing
- energy design and conservation
- environmental management.

## *What will I LEARN in Energy and Mines?*

At the introductory level, you study:
- Alberta geological survey
- renewable and nonrenewable resources
- the conservation challenge
- consumer products and services
- fundamentals of recycling.

At the intermediate and advanced levels, you study:
- managing Alberta's energy and minerals
- exploration, recovery and production techniques
- refining and manufacturing
- renewable energy technology
- the energy–environment connection
- low energy designs and systems.

## *Energy and Mines Courses*

**Introductory**
- Overview of Alberta Geology
- Nonrenewable Resources
- Renewable Resources
- Consumer Products & Services
- Fundamentals of Recycling
- Conservation Challenge

**Intermediate**
- Managing Alberta's Resources
- Conventional Oil/Gas 1 (Resource Exploration)
- Oil Sands/Heavy Oil/Coal 1 (Resource Exploration)
- Metals/Nonmetals 1 (Resource Exploration)
- Renewable Energy Technology
- Refining Hydrocarbons
- Refining Rocks & Minerals
- Supply & Distribution
- Energy Designs/Systems 1 (Basic Principles)
- Environmental Safety

**Advanced**
- Energy & the Environment
- Conventional Oil/Gas 2 (Recovery & Production)
- Oil Sands/Heavy Oil/Coal 2 (Recovery & Production)
- Metals/Nonmetals 2 (Recovery & Production)
- Sustainable Energy (The Power & Potential)
- Petrochemicals
- Industrial Materials (Primary Manufacturing)
- Market Basics & Trends
- Energy Designs/Systems 2 (Practical Applications)
- Integrated Resource Management (Balancing Needs)

## *WHERE can this TAKE me?*

**Jobs!** Fossil fuels and alternative sources of energy are crucial for the future industrial development of Alberta and Canada. There is a broad range of employment options in the energy and mining area. Over 70 potential careers have been identified, including:
- environmental engineers
- field production operators
- gas plant operators
- geologists, geochemists and geophysicists
- mechanical engineers
- mining engineers
- nuclear engineering technicians
- oil pipeline operators
- petroleum engineering technologists.

**Post-secondary Education!** About two-thirds of the careers in energy and mines require some form of post-secondary education. In Alberta, almost every college and university offers programs in this area.

In addition, you may be eligible to apply for either credits or advanced standing in some post-secondary programs.

See your counsellor for more information.

## *What ELSE do I need to know?*

CTS Enterprise and Innovation courses strongly support knowledge and skills learned in all courses and other CTS strands. They also help you expand on the possibilities offered by other strands, and help you become:

- more accepting of both success and failure as learning opportunities
- more aware of public and private sector development initiatives and investments
- more comfortable with change and innovation
- more entrepreneurial in any career
- more sophisticated consumers of business services.

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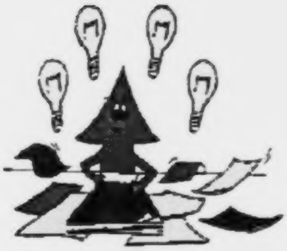

## ENTERPRISE AND INNOVATION

(Revised 1998)

Alberta
EDUCATION

## *WHAT'S it all ABOUT?*

Enterprise and Innovation encourages you to develop your confidence, experience and skills as innovators and leaders. You learn to recognize opportunities around you, and turn them into success in any career, whether as a volunteer, an employer or an employee.

The CTS Enterprise and Innovation strand provides an opportunity for you to explore:
- creative thinking
- goal setting
- communicating
- researching/organizing
- decision making/problem solving
- using information and technology effectively
- team-building
- managing
- planning.

## *What will I LEARN in Enterprise and Innovation?*

At the introductory level, you learn about:
- creating venture opportunities
- challenge and opportunity
- planning a venture.

At the intermediate and advanced levels, you learn about:
- analyzing ventures
- financing ventures
- marketing the venture
- implementing the venture
- managing the venture
- expanding the venture.

## *Enterprise and Innovation Courses*

**Introductory**
- Challenge & Opportunity
- Planning a Venture

**Intermediate**
- Analyzing Ventures
- Financing Ventures
- Marketing the Venture
- Implementing the Venture

**Advanced**
- Managing the Venture
- Expanding the Venture

## *WHERE can this TAKE me?*

As you move toward independence and increased responsibility, you will make crucial career decisions. In view of the frequent career changes that you can expect to experience throughout your work life, you need to develop knowledge and skills that can be transferred readily. At the same time, opportunities to explore career options can help you invest your energies more effectively in those occupational areas you are interested in. The Enterprise and Innovation strand will help in any career, whether as a volunteer, an employer or an employee.

In the CTS Enterprise and Innovation strand, you have the opportunity to develop and implement venture plans that are community-, service-, public service-, or profit-related. For example, you may:
- establish a business venture
- establish a volunteer, community or service program
- plan, market and manage an event or a conference
- produce, market and distribute a book or a video.

See your counsellor for more information.

## *What ELSE do I need to know?*

CTS Fabrication Studies courses strongly support what you learn in:

- Language Arts
- Mathematics
- Science
- Social Studies
- CTS Agriculture
- CTS Construction Technologies
- CTS Design Studies
- CTS Energy and Mines
- CTS Enterprise and Innovation
- CTS Logistics
- CTS Mechanics.

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# Career and Technology Studies

## FABRICATION STUDIES

(Revised 1998)

Alberta
EDUCATION

## *WHAT'S it all ABOUT?*

Metal products and structures have shaped world history. Even today, the search continues to develop new metals, processes and products for the 21st century.

Fabrication Studies will give you the opportunity to investigate and develop the knowledge and skills necessary to transform metal and other related materials into various products and structures, and to use this knowledge to make informed career choices.

The CTS Fabrication Studies strand provides an opportunity for you to explore:

- materials and structures
- fabrication processes, such as cutting, bending, joining and finishing
- production systems and processes, such as casting and machining.

## *What will I LEARN in Fabrication Studies?*

At the introductory level, you study:

- construction and fabrication processes
- welding skills
- fabrication principles
- principles of machining
- production systems.

At the intermediate and advanced levels, you study:

- structural design and engineering
- print reading
- forging fundamentals
- material testing
- foundry
- computer numerical controlled turning and milling.

## *Fabrication Studies Courses*

**Introductory**

- Basic Tools & Materials
- Oxyacetylene Welding
- Basic Electric Welding
- Bar & Tubular Fabrication
- Sheet Fabrication 1 (Hand Processes)
- Fabrication Principles
- Foundry 1 (One-piece Pattern)
- Principles of Machining
- Production Systems

**Intermediate**

- Structural Engineering
- Print Reading
- Oxyfuel Welding
- Thermal Cutting
- Arc Welding 1 and 2
- Gas Metal Arc Welding 1
- Pipe Fitting
- Sheet Fabrication 2 (Machine Processes)
- Sheet Fabrication 3 (Parallel Line)
- Forging Fundamentals
- Foundry 2 (Split Pattern)
- Precision Turning1
- Precision Milling 1
- CNC Turning (Computer Numerical Control)
- Custom Fabrication

**Advanced**

- Materials Testing
- Metallurgy Fundamentals
- Gas Tungsten Arc Welding
- Specialized Welding
- Arc Welding 3 and 4
- Gas Metal Arc Welding 2
- Pipe & Tubular Welding
- Automated Welding
- Sheet Fabrication 4 (Radial Line)
- Sheet Fabrication 5 (Duct Components)
- Foundry 3 (Core Molding)
- Precision Turning 2
- Precision Milling 2
- CNC Milling (Computer Numerical Control)
- Prefabrication Principles

## *WHERE can this TAKE me?*

To compete in the North American and global markets, the fabricated materials sector is investing in leading-edge technology and needs highly trained and talented people to manage and operate this technology. The CTS Fabrication Studies strand provides a base for fourteen occupations requiring high school education and for nine related trades. These include:

- boiler makers
- contractors and supervisors
- forging machine operators
- ironworkers
- material engineering technologists
- plastics processing machine operators
- sprinkler systems installers
- steamfitters/pipefitters
- tool and die makers
- welders.

**Post-secondary Education!** Many careers in fabrication studies require some form of post-secondary education. In Alberta, numerous public, private and vocational colleges offer apprenticeship programs in this area.

In addition, you may be eligible to apply for either credits or advanced standing in some post-secondary programs.

See your counsellor for more information.

## *What ELSE do I need to know?*

CTS Fashion Studies courses strongly support what you learn in:

- Art
- Drama
- Mathematics
- Social Studies
- CTS Career Transitions
- CTS Design Studies
- CTS Enterprise and Innovation
- CTS Management and Marketing.

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# Career and Technology Studies

## FASHION STUDIES

(Revised 1998)

Alberta
EDUCATION

## *WHAT'S it all ABOUT?*

The fashion industry is the second largest employer in Alberta's consumer products industry. At the same time, it is a growing economic link between Canada and other nations. Canadian designers, producers and merchandisers are thriving in the international fashion industry. CTS Fashion Studies can make you a part of this enterprise by giving you knowledge of the fashion world, and the ability to design, construct and market fashion projects.

The CTS Fashion Studies strand provides an opportunity for you to explore:

- production
- design
- merchandising of clothing, textiles and accessories.

## *What will I LEARN in Fashion Studies?*

At the introductory level, you study:

- basic sewing
- creative construction
- how to create home and personal accessories
- yarns and textiles
- repairing and recycling garments.

At the intermediate and advanced levels, you study:

- upholstery
- fashion dynamics
- fashion merchandising and retailing
- contemporary tailoring
- couture
- cultural fashions
- fashion illustration.

## *Fashion Studies Courses*

**Introductory**
- Ready, Set, Sew!
- Fashion Basics
- Repair & Recycle
- Creating Accessories 1
- Creative Yarns/Textiles

**Intermediate**
- Creative Construction
- Activewear
- Surface Embellishment
- Specialty Fabrics 1
- Sewing for Others
- Creating Home Decor
- Creating Accessories 2
- Upholstery
- Flat Pattern
- Pattern Drafting 1
- CAD Patterns 1 (Computer-aided Design)
- Evolution of Fashion
- Fashion Dynamics
- Fashion Illustration 1
- Fashion Merchandising

**Advanced**
- Contemporary Tailoring
- Couture
- Cultural Fashions
- Specialty Fabrics 2
- Pattern Drafting 2
- CAD Patterns 2 (Computer-aided Design)
- Creators of Fashion
- Fashion Illustration 2
- Fashion Retailing

## *WHERE can this TAKE me?*

The fashion industry in Alberta employs in design, production and retail, about 10 000 people, and generates annual revenues in the vicinity of $900 million. You can apply your personal interests, abilities and aptitudes in more than 30 occupations related to the fashion field. These include:

- fashion designers
- display designers
- image, social and other personal consultants
- industrial engineering and manufacturing technologists
- textile processing workers/supervisors
- patternmakers
- retail trade managers
- tailors, dressmakers, furriers
- theatre, fashion, exhibit and other creative designers.

**Post-secondary Education!** There are many opportunities in Alberta for post-secondary learning in the area of fashion. At the same time, there are a number of federal and industry initiatives to help you reach your career goals through active participation in this field.

See your counsellor for more information.

### *What ELSE do I need to know?*

CTS Financial Management courses strongly support what you learn in:

- Language Arts
- Mathematics
- Social Studies
- CTS Career Transitions
- CTS Enterprise and Innovation
- CTS Information Processing
- CTS Management and Marketing.

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# Career and Technology Studies

## FINANCIAL MANAGEMENT

(Revised 1998)

Alberta
EDUCATION

## WHAT'S it all ABOUT?

Financial management is required in all aspects of society. In the CTS Financial Management strand, you study the use of financial data to enable you to manage your own financial affairs and those of a small business.

The CTS Financial Management strand provides an opportunity for you to explore:

- ethics in personal and business financial management
- the application and analysis of financial information
- communicating
- researching/organizing
- decision making/problem solving
- how to use information and technology effectively
- team-playing
- managing
- planning.

## What will I LEARN in Financial Management?

At the introductory level, you study:

- introduction to financial management
- accounting for a service business.

At the intermediate and advanced levels, you study:

- personal and small business taxation
- accounting for a merchandise business
- financial accounting
- forms of business organization
- financial planning and analysis.

## Financial Management Courses

**Introductory**
- Financial Information
- Service Business 1 and 2

**Intermediate**
- Taxation (Personal & Small Business)
- Merchandising Business 1 and 2
- Financial Software
- Financial Simulation

**Advanced**
- Advanced Accounting
- Management Accounting
- Business Organizations
- Financial Statements
- Financial Analysis
- Financial Planning

## WHERE can this TAKE me?

The CTS Financial Management strand offers you an opportunity to learn about the development and use of financial information, and to profitably apply this information to your personal and business life. The field of financial management offers many occupational opportunities. These include:

- accountants
- banking, credit and investment managers
- economic development officers
- economists
- financial and investment analysts
- financial planners
- insurance agents and brokers
- insurance adjusters and claims examiners
- investment advisors
- marketing researchers and consultants
- real estate agents and salespersons
- supervisors, finance and insurance clerks.

**Post-secondary Education!** Many businesses welcome people who are prepared to extend their training in one of the post-secondary programs in the financial management-related area. In Alberta, numerous public and private colleges and all universities offer education options in this field.

See your counsellor for more information.

## *What ELSE do I need to know?*

CTS Foods courses strongly support what you learn in:

- Biology
- Chemistry
- Health and/or Personal Development
- Mathematics
- Science
- CTS Agriculture
- CTS Career Transitions
- CTS Community Health
- CTS Design Studies
- CTS Enterprise and Innovation
- CTS Management and Marketing
- CTS Tourism Studies.

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# Career and Technology Studies

## FOODS

(Revised 1998)

## *WHAT'S it all ABOUT?*

One of every three jobs in Alberta is related to the agriculture and food industry. In a constantly changing society, our food needs will be met in increasingly varied ways. The CTS Foods strand will help you develop knowledge of the nature of food and nutrition, as well as skill in the preparation and presentation of food.

The CTS Foods strand provides an opportunity for you to explore:

- nature of food
- nutrition/health
- management
- safety, sanitation and equipment
- preparation, presentation and service of food
- consumerism/food selection
- multicultural aspects of food
- food and ecology
- how to create a career portfolio.

## *What will I LEARN in Foods?*

At the introductory level, you study:

- food basics
- baking basics
- meal planning
- Canadian heritage foods.

At the intermediate and advanced levels, you study:

- nutrition and athletic performance
- food decisions and health
- creative baking
- short order cooking
- vegetarian cuisine
- international cuisine
- food processing
- the food entrepreneur.

## *Foods Courses*

**Introductory**

- Food Basics
- Baking Basics
- Snacks & Appetizers
- Meal Planning 1
- Fast & Convenience Foods
- Canadian Heritage Foods

**Intermediate**

- Food & Nutrition Basics
- Nutrition & the Athlete
- Food Decisions & Health
- Cake & Pastry
- Yeast Breads & Rolls
- Milk Products & Eggs
- Stocks, Soups & Sauces
- Vegetables/Fruits/Grains
- Creative Cold Foods
- Basic Meat Cookery
- Fish & Poultry
- Meal Planning 2
- Vegetarian Cuisine
- Rush Hour Cuisine
- Food Safety & Sanitation
- Food Venture
- International Cuisine 1

**Advanced**

- Food for the Life Cycle
- Nutrition & Digestion
- Creative Baking
- Advanced Yeast Products
- Advanced Soups & Sauces
- Food Presentation
- Short Order Cooking
- Advanced Meat Cookery
- Basic Meat Cutting
- Entertaining with Food
- Food Processing
- Food Evolution/Innovation
- The Food Entrepreneur
- International Cuisine 2

## *WHERE can this TAKE me?*

**Jobs!** An important part of the food industry in Canada is the food services industry, which employs over 600 000 people; this number is expected to rise to almost 800 000 by the year 2000. Occupations in this industry vary widely. They include:

- banqueting/catering supervisors
- bakers
- biological technicians and technologists
- butchers and meat cutters
- chefs/cooks
- food service supervisors
- manufacturing managers
- purchasing managers
- restaurant and food service managers
- testers and graders, foods and beverage processing

**Post-secondary Education!** Many careers in the food industry require some form of post-secondary education. In Alberta, almost every college and university offers programs in this area. There are also numerous government and industry initiatives that provide continuing education programs.

In addition, you may be eligible to apply for either credits or advanced standing in some post-secondary programs.

See your counsellor for more information.

### *What ELSE do I need to know?*

CTS Forestry courses strongly support what you learn in:

- Biology
- Physical Education
- Science
- Social Studies
- CTS Agriculture
- CTS Community Health
- CTS Energy and Mines
- CTS Legal Studies
- CTS Management and Marketing
- CTS Tourism Studies
- CTS Wildlife.

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# Career and Technology Studies

## FORESTRY

(Revised 1998)

Alberta
EDUCATION

## *WHAT'S it all ABOUT?*

Forested lands in Alberta and Canada provide resources important to our economic strength and quality of life. The CTS Forestry strand gives you an opportunity to learn about the dynamics of a forest ecosystem and the many benefits and industry practices associated with our use of the forested lands.

The CTS Forestry strand provides an opportunity for you to explore:

- the economic, environmental and social significance of forested lands
- forest ecology
- recreational use of forests
- silviculture and harvest practices
- technologies and research programs
- sustainable management and conservation
- environmental protection.

## *What will I LEARN in Forestry?*

At the introductory level, you study:

- forest regions of Canada
- woods survival
- mapping and aerial photography
- forest ecology.

At the intermediate and advanced levels, you study:

- managing Alberta's forested lands
- measuring the forest
- harvesting and forest products
- issues in forestry
- forest technology applications
- silviculture.

## *Forestry Courses*

**Introductory**

- Why Forestry?
- Forest Regions of Canada
- Woods Survival 1 (Survival Skills)
- Mapping & Aerial Photos
- Measuring the Forest 1 (Measurement Skills)
- Forest Ecology 1 (Ecosystem Dynamics)
- Forests Forever 1 (Forest Use & Protection)

**Intermediate**

- Making a Difference (Protection & Stewardship)
- Managing Alberta Forests
- Woods Survival 2 (Wilderness Excursion)
- Measuring the Forest 2 (Sampling Techniques)
- Harvest Practices (Fibre Harvest & Processing)
- Forests Forever 2 (Management Practices)
- Users in the Forest

**Advanced**

- Issues in Forestry
- Measuring the Forest 3 (Survey Applications)
- The Forest Marketplace
- Forest Technology Applications
- Forest Ecology 2 (Silvics & Succession)
- Silviculture (Growing the Forest)
- Integrated Resource Management (Balancing Needs)

## *WHERE can this TAKE me?*

**Jobs!** As forests cover almost two-thirds of Alberta, forestry is one of the major industries in the province, offering a wide variety of employment opportunities. Occupations related to this field include:

- botanists
- biochemists
- biologists
- environmental education specialists
- environmental engineers
- forest technologists
- hazardous waste management technicians
- hydrologists
- land surveyors
- logging and forestry workers
- pollution control technicians
- sawmill machine operators
- silviculture and forestry supervisors.

**Post-secondary Education!** About two-thirds of the careers in forestry require some form of post-secondary education. In Alberta, almost every college and university offers programs in this area.

In addition, you may be eligible to apply for either credits or advanced standing in some post-secondary programs.

See your counsellor for more information.

### *What ELSE do I need to know?*

CTS Information Processing courses strongly support what you learn in:

- Language Arts
- Mathematics
- Science
- Social Studies
- CTS Career Transitions
- CTS Communication Technology
- CTS Design Studies
- CTS Enterprise and Innovation
- CTS Financial Management
- CTS Foods
- CTS Management and Marketing
- CTS Tourism Studies.

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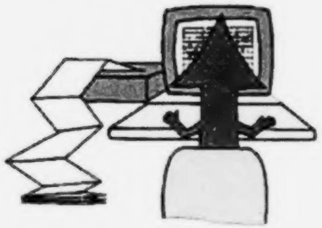
# Career and Technology Studies



## INFORMATION PROCESSING

(Revised 1998)

Alberta
EDUCATION

## *WHAT'S it all ABOUT?*

Accurate, timely information is the basis for sound decision making and effective communication. In the CTS Information Processing strand, you study electronic information technologies as they apply to personal use and the business environment.

The CTS Information Processing strand provides an opportunity for you to explore:
- system operations
- text/data input
- productivity software
- applied processing
- dynamic environments
- programming.

## *What will I LEARN in Information Processing?*

At the introductory level, you study:
- computer operations
- word processing
- graphic tools
- media tools
- programming
- the information highway.

At the intermediate and advanced levels, you study:
- hardware/software analysis
- telecommunications
- local area networks
- electronic publishing
- expert systems
- word processing applications
- internet services
- programming applications.

## *Information Processing Courses*

**Introductory**
- Computer Operations
- Keyboarding 1
- Word Processing 1
- Graphics Tools
- Database 1
- Spreadsheet 1
- Information Highway 1
- Hypermedia Tools
- Programming 1

**Intermediate**
- Workstation Operations
- Telecommunications 1
- Keyboarding 2 and 3
- Word Processing 2
- Electronic Publishing 1
- Database 2
- Spreadsheet 2
- Multimedia Authoring 1
- Correspondence
- Reports
- Tables/Forms
- Software Integration 1
- Information Highway 2
- Process Control
- Programming 2, 3, 4 and 5

**Advanced**
- Hardware/Software Analysis
- Local Area Networks
- Telecommunications 2
- Keyboarding 4, 5 and 6
- Word Processing 3
- Electronic Publishing 2
- Information Management Tools
- Multimedia Authoring 2
- Specialization 1 and 2
- Software Integration 2 and 3
- Information Highway 3
- Internet Services
- Expert Systems
- Programming Application 1, 2 and 3

## *WHERE can this TAKE me?*

**Jobs!** Today, electronic technologies are crucial for managing information efficiently. Skills and knowledge acquired in the area of information processing can be used in a wide variety of occupations. These include:
- administrative officers
- computer engineers
- computer programmers
- demographers
- desktop publishing specialists
- economists
- health record administrators
- information systems consultants
- librarians
- secretaries
- survey interviewers and statistical clerks.

**Post-secondary Education!** About two-thirds of the careers in information processing require some form of post-secondary education. In Alberta, almost every college and university offers programs in this area.

See your counsellor for more information.

### *What ELSE do I need to know?*

CTS Legal Studies courses strongly support what you learn in:

- Language Arts
- Personal Development
- Social Studies
- CTS Agriculture
- CTS Career Transitions
- CTS Construction Technologies
- CTS Energy and Mines
- CTS Enterprise and Innovation
- CTS Fabrication Studies
- CTS Forestry
- CTS Tourism Studies
- CTS Wildlife.

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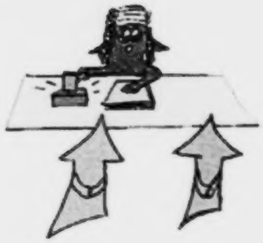
# Career and Technology Studies



## LEGAL STUDIES

(Revised 1998)

Alberta
EDUCATION

## *WHAT'S it all ABOUT?*

The law is fundamental to society. The CTS Legal Studies strand offers you the opportunity to learn basic and practical information about the law, the ways in which it affects your daily life, and how you can participate in its evolution.

The CTS Legal Studies strand provides an opportunity for you to explore:
- decision making
- problem solving
- communicating
- critical thinking
- rights and responsibilities imposed by the law
- ability to influence the law
- career options related to the law.

## *What will I LEARN in Legal Studies?*

At the introductory level, you study:
- law in the personal context.

At the intermediate and advanced levels, you study:
- family law
- labour law
- environmental law
- criminal law
- consumer and property law
- dispute resolution
- laws affecting small business
- controversy and change
- landmark decisions.

## *Legal Studies Courses*

**Introductory**
- You & the Law 1 (as a Consumer and as a Family Member)
- You & the Law 2 (in Society and in the Workplace)

**Intermediate**
- Family Law
- Labour Law
- Environmental Law
- Law & the Traveller

**Advanced**
- Consumer & Property Law
- Dispute Resolution
- Negligence
- Law & Small Business
- Controversy & Change
- Landmark Decisions
- Criminal Law

## *WHERE can this TAKE me?*

There are many law-related occupational opportunities available to you, including:
- correctional officers
- court clerks
- court reporters
- customs inspectors
- immigration officers
- judges
- land titles examiners
- lawyers
- parole officers
- private investigators
- sheriffs and bailiffs.

**Post-secondary Education!** Although the CTS Legal Studies strand is designed to provide you with the knowledge and skills needed in the workplace, many law-related careers require post-secondary training. All major colleges and universities in Alberta offer programs in this area.

See your counsellor for more information.

### *What ELSE do I need to know?*

CTS Logistics courses strongly support what you learn in:

- Social Sciences
- Social Studies.

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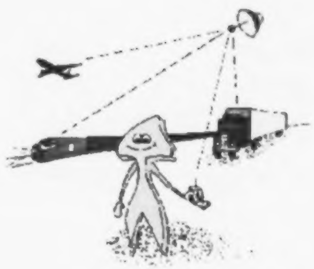
# Career and Technology Studies



## LOGISTICS

(Revised 1998)

Alberta
EDUCATION

## *WHAT'S it all ABOUT?*

Logistics systems occupy unique places in our economy. They provide solutions for the movement of goods from producer to consumer. The CTS Logistics strand offers you insight into the process of moving goods by land, air, water and in space, and the ways in which this movement affects all facets of our daily lives, our environment, and the areas of business and commerce.

The CTS Logistics strand provides an opportunity for you to explore:

- designing
- controlling
- implementing
- managing
- operating the transportation of goods, including information.

## *What will I LEARN in Logistics?*

At the introductory level, you study:

- introduction to logistics
- warehousing and distribution
- traffic and transportation.

At the intermediate and advanced levels, you study:

- advanced warehousing and distribution
- purchasing
- inventory management and control.

## *Logistics Courses*

**Introductory**

- Logistics
- Warehouse & Distribute 1
- Traffic & Transport 1
- Purchasing 1

**Intermediate**

- Warehouse & Distribute 2
- Traffic & Transport 2
- Purchasing 2
- Inventory Management 1

**Advanced**

- Warehouse & Distribute 3
- Traffic & Transport 3
- Purchasing 3
- Inventory Management 2

## *WHERE can this TAKE me?*

The logistics sector is both diverse and complex, and it is an essential force in the social, cultural and economic development of Canada. This sector links Canadians to other nations and markets, providing many challenging and rewarding career opportunities for qualified people. These include:

- aerospace engineers
- aircraft assembly inspectors
- aircraft mechanics
- air traffic controllers
- couriers and messengers
- deck officers, water transport
- facility operations managers
- postal and courier services managers
- railway and marine traffic controllers
- retail trade managers
- technical inspectors
- truck drivers.

Linkages exist with all other CTS strands where products and information are produced, moved to and finally reach the ultimate consumers.

**Post-secondary Education!** Many of the systems and strategies introduced in the CTS Logistics strand lead to further learning and specialization, either through workplace experience or post-secondary study.

See your counsellor for more information.

## *What ELSE do I need to know?*

CTS Management and Marketing courses strongly support what you learn in:

- Fine Arts
- Language Arts
- Mathematics
- Social Studies
- CTS Career Transitions
- CTS Communication Technology
- CTS Design Studies
- CTS Enterprise and Innovation
- CTS Fashion Studies
- CTS Financial Management
- CTS Information Processing
- CTS Logistics.

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# Career and Technology Studies

## MANAGEMENT AND MARKETING

(Revised 1998)

Alberta
EDUCATION

## *WHAT'S it all ABOUT?*

In today's rapidly changing, competitive society no matter what you do, you manage and market yourself, resources available to you, your services or the products you make. The CTS Management and Marketing strand offers you the skills to organize and work with people in an effective manner, and helps you identify strategies for managing and marketing products, services and information.

The CTS Management and Marketing strand provides an opportunity for you to explore:

- business management
- marketing
- information management
- organizing and planning
- leading, monitoring and communicating
- problem solving
- decision making.

## *What will I LEARN in Management and Marketing?*

At the introductory level, you study:

- management and marketing basics
- quality customer service
- communication strategies.

At the intermediate and advanced levels, you study:

- office systems
- advertising and promotion
- retail operations
- records management
- business in the Canadian and global marketplace
- setting up a retail store.

## *Management and Marketing Courses*

**Introductory**

- Management & Marketing Basics
- Quality Customer Service
- Communication Strategies 1

**Intermediate**

- Managing for Quality
- Promotion: Advertising
- Promotion: Visual Merchandising
- Retail Operations
- Office Systems 1
- Communication Strategies 2
- Records Management 1

**Advanced**

- The Business Organization
- Business in the Canadian Economy
- Business in the Global Marketplace
- Promotion: Sales Techniques
- Distributing Goods & Services
- Setting Up a Retail Store
- Office Systems 2
- Communication Strategies 3
- Records Management 2

## *WHERE can this TAKE me?*

The CTS Management and Marketing strand offers you the knowledge and skills in retail, business and information management necessary for the competitive work environment. This strand can help you explore a wide range of career opportunities, including:

- architecture and science managers
- banking, credit and investment managers
- construction managers
- economic development officers
- financial managers
- health care managers
- market research analysts
- property managers
- sales, marketing and advertising managers
- transportation managers.

**Post-secondary Education!** Many of the systems and strategies introduced in the CTS Management and Marketing strand lead to further learning and specialization, either through workplace experience or post-secondary study.

See your counsellor for more information.

## *What ELSE do I need to know?*

CTS Mechanics courses strongly support what you learn in:

- Language Arts
- Mathematics
- Science
- CTS Agriculture
- CTS Career Transitions
- CTS Construction Technologies
- CTS Electro-Technologies
- CTS Enterprise and Innovation
- CTS Fabrication Studies.

**FOR FURTHER INFORMATION ABOUT CTS:**

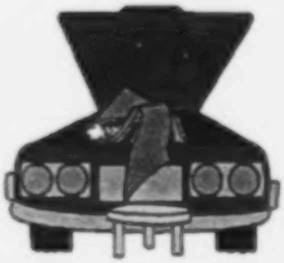
- visit our home page on the Internet to review general information, review curriculum documents, or read about "What's New in CTS" at <**http://ednet.edc.gov.ab.ca/cts**>
- contact the Program Manager, Career and Technology Studies or the Director, Curriculum Standards Branch, Alberta Education, telephone 422-4872, fax 422-0576. To be connected toll free outside of Edmonton, dial 310-0000.

School systems/schools please contact the CTS Program Coordinator for your jurisdiction.

**Note**: Edmonton Telephone Numbers
The long distance area code **403** applies to the above numbers until mid-January 1999.

After mid-January 1999, the long distance area code is **780**.

# Career and Technology Studies



## MECHANICS

(Revised 1998)

Alberta
EDUCATION

## *WHAT'S it all ABOUT?*

The transportation industry is very large and diverse, offering many opportunities for a rewarding career, either in design and production or in servicing of motor vehicles. The CTS Mechanics strand will help you recognize these opportunities and turn them into rewarding, lucrative careers.

The CTS Mechanics strand provides an opportunity for you to explore:

- vehicle design and ownership
- propulsion systems
- guidance and control systems
- suspension and structural systems
- project and service work.

## *What will I LEARN in Mechanics?*

At the introductory level, you study:

- modes and mechanisms
- vehicle service and care
- engine fundamentals
- pneumatic and hydraulic systems.

At the intermediate and advanced levels, you study:

- vehicle detailing
- alternative fuel systems
- power trains
- vehicle value appraisal
- safety systems
- structural damage repair.

## *Mechanics Courses*

**Introductory**
- Modes & Mechanisms
- Vehicle Service & Care
- Engine Fundamentals
- Electrical Fundamentals
- Pneumatics & Hydraulics
- Mechanical Systems
- Ride & Control Systems
- Structures & Materials
- Metal Forming & Finishing
- Surface Preparation 1

**Intermediate**
- Vehicle Detailing
- Vehicle Maintenance
- Lubrication & Cooling
- Fuel & Exhaust Systems
- Alternative Fuel Engines
- Ignition Systems
- Emission Controls
- Electrical Components
- Power Assist Accessories
- Braking Systems
- Hydraulic Accessories
- Drive Trains
- Transmissions/Transaxles
- Suspension Systems
- Steering Systems
- Metal Repair & Finishing
- Trim Replacement
- Surface Preparation 2
- Refinishing 1
- Touch-up & Finishing
- Interior Repairs

**Advanced**
- Buying & Selling Vehicles
- Vehicle Value Appraisal
- Engine Diagnosis
- Engine Tune-up
- Engine Replacement
- Engine Reconditioning 1 and 2
- Alternative Energy Systems
- Computer Systems

**Advanced** (continued)
- Safety Systems
- Climate Control
- Power Assisting
- Automatic Transmissions
- Drive Train Repair
- Wheel Alignment
- Body Repair Estimation
- Damage Analysis
- Damage Repair 1 and 2
- Refinishing 2
- Plastic & Fibreglass
- Glass Replacement
- Refinishing 3

## *WHERE can this TAKE me?*

The CTS Mechanics strand offers you hands-on experience, knowledge and skills related to the design and maintenance of transportation vehicles, and the affect they have on the environment and the economy. This is an educational opportunity that introduces you to a wide variety of occupations in this field, including:

- aircraft maintenance engineers
- agriculture mechanics
- auto body technicians
- automotive service technicians
- electronic assemblers, fabricators, inspectors and testers
- elevator constructors
- machine fitters
- manufacturing managers
- mechanical engineers.

**Post-secondary Education!** The majority of occupations in mechanics require additional apprenticeship or vocational training.

See your counsellor for more information.

## *What ELSE do I need to know?*

CTS Tourism Studies courses strongly support what you learn in:
- Fine Arts
- Language Arts
- Social Studies
- CTS Agriculture
- CTS Career Transitions
- CTS Communication Technology
- CTS Enterprise and Innovation
- CTS Foods
- CTS Forestry
- CTS Management and Marketing
- CTS Wildlife.

### FOR FURTHER INFORMATION ABOUT CTS:

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# Career and Technology Studies

## TOURISM STUDIES

(Revised 1998)

Alberta
EDUCATION

## *WHAT'S it all ABOUT?*

Tourism is one of Alberta's fastest growing industries. As the third largest industry in Alberta, tourism employs 100 000 people and generates $2.5 billion in revenues. By the year 2000, tourism is expected to be one of the top revenue generators in the province. Almost 70 per cent of the province's tourism business comes from Albertans travelling within their own province.

The CTS Tourism Studies strand provides an opportunity for you to explore the tourism industry in general and delve into the four sectors:

- food
- accommodation
- travel
- attractions.

## *What will I LEARN in Tourism Studies?*

At the introductory level, you study:

- the tourism industry
- quality guest service
- food sector
- travel sector
- accommodation sector
- attractions sector.

At the intermediate and advanced levels, you study:

- tourism events
- meetings and conferences
- tourism destinations
- travel planning
- tourism interpretation
- alternative accommodations
- adventures and ecotourism.

## *Tourism Studies Courses*

**Introductory**

- The Tourism Industry
- People & Places
- Quality Guest Service
- The Food Sector
- The Accommodation Sector
- The Travel Sector
- The Attractions Sector

**Intermediate**

- Tourism Events
- Food Functions
- Meetings & Conferences
- Tourism Destinations 1 and 2
- Travel Planning
- Tourism Interpretation 1 and 2

**Advanced**

- Food Service Operations
- Hotel/Motel Operations
- Alternative Accommodations
- Travel Agency Operations
- Reservations & Ticketing
- Air Transportation
- Surface Transportation
- Attractions Operations
- Adventure & Ecotourism

## *WHERE can this TAKE me?*

Tourism is a sustainable industry. It encompasses business, organizations, labour and government agencies that provide transportation, goods, services, accommodation and other facilities and programs. The tourism industry offers a great scope of occupations and career paths, including:

- accommodation service managers
- amusement attraction operators
- banquet catering supervisors
- conference and event planners
- entrepreneurs
- interpretative naturalists
- outdoor sport and recreation guides
- pursers and flight attendants
- recreation and sports directors
- small business owners/operators
- social planners
- travel consultants.

**Post-secondary Education!** Many occupations in tourism require additional training in colleges or universities. Related programs are offered at most post-secondary institutions in Alberta.

See your counsellor for more information.

## *What ELSE do I need to know?*

CTS Wildlife courses strongly support what you learn in:

- Biology
- Language Arts
- Physical Education
- Science
- Social Studies
- CTS Agriculture
- CTS Career Transitions
- CTS Community Health
- CTS Forestry
- CTS Legal Studies
- CTS Tourism Studies.

**FOR FURTHER INFORMATION ABOUT CTS:**

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# Career and Technology Studies

## WILDLIFE

(Revised 1998)

Alberta
EDUCATION

## WHAT'S it all ABOUT?

Canada is one of the few places in the world that still contains large natural ecosystems. Natural and wilderness areas contribute greatly to the quality of life and the functioning of the global ecosystem. The CTS Wildlife strand offers you the opportunity to learn about all wild organisms and their habitats, and to examine your relationship with the natural environment.

The CTS Wildlife strand provides an opportunity for you to explore:

- the economic, environmental and social significance of wildlife
- trends in habitat and populations
- interactions between wildlife and society
- technologies and research programs
- sustainable management and conservation of species and ecosystems.

## What will I LEARN in Wildlife?

At the introductory level, you study:

- natural history of Alberta wildlife
- related hunting and game management
- outdoor experiences
- fishing and aquatic environment.

At the intermediate and advanced levels, you study:

- measuring the value of wildlife
- wildlife spaces and species
- interactions of wildlife and society
- wildlife management
- application of wildlife research
- issues in wildlife.

## Wildlife Courses

**Introductory**

- What Is Wildlife?
- Natural History of Wildlife
- Outdoor Experiences 1 (Survival Skills)
- Taking Responsibility (People, Culture & Wildlife)
- Hunting & Game Management 1 (Ethics/Game Identification)
- Angling & Fish Management

**Intermediate**

- Measuring the Value (Diversity of Wildlife Values)
- Outdoor Experiences 2 (Wilderness Excursion)
- Wildlife Spaces & Species
- Interactions (Wildlife & Society)
- Hunting & Game Management 2 (Field Techniques/Regulations)
- Issues in Wildlife 1 (Research & Analysis)

**Advanced**

- Making a Difference (Protection & Stewardship)
- Wildlife Research
- Wildlife Management 1 (Basic Principles)
- Wildlife Management 2 (Applications)
- Issues in Wildlife 2 (Negotiation & Debate)

## WHERE can this TAKE me

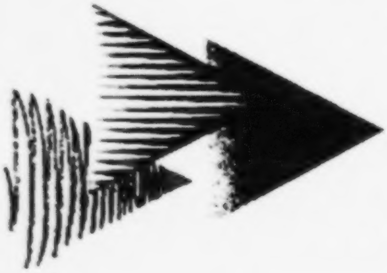
Changes to ecosystems, brought about by bal warming and the effects of air pollutants, eaten both wildlife and people. The CTS Wildl strand offers you an opportunity to fulfill social, ltural and economic goals through responsible use o atural resources, and to apply this knowledge to road range of career paths. Occupations in th eld include:

- animal health technologists
- biochemists
- botanists
- environmental engineers
- hazardous waste management technic ns
- hydrologists
- marine biologists
- oceanographers
- park rangers
- pollution control technicians
- veterinarians.

**Post-secondary Education!** The majori of wildlife-related occupations require addi nal post-secondary education. Numerous ins utions in Alberta offer programs in this area.

In addition, you may be eligible to apply r either credits or advanced standing in some pos econdary programs.

See your counsellor for more information



# CAREER & TECHNOLOGY STUDIES

Manual for Administrators, Counsellors and Teachers

## Appendix 2:

# Defining CTS Learning Environments—Strand and Course Parameters

June 1998

*The information and recommendations provided in this appendix do not in any way replace the collaboration and professional advice required for establishing effective learning environments at school and school system levels.*

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## PURPOSE

This appendix is designed to assist school and school system administrators and teachers to plan for the delivery of CTS in their schools and communities. It provides information regarding suitable learning environments for each CTS strand and course, and guidelines for developing CTS facilities. Schools and school systems may use this information to:

- decide which strands and courses to make available to students
- organize for learning by:
  - selecting appropriate on-campus and off-campus learning sites
  - scheduling facilities and equipment to maximize student access to courses
  - identifying program components or entire courses that may be effectively delivered through distance education technologies
- plan for change through:
  - upgrades to present facilities and equipment
  - the design of new facilities
  - the purchase of new equipment.

## STRAND AND COURSE PARAMETERS★

A set of strand and course parameters are defined for each of the following CTS strands:

Refer to Attachment 1: Strand and Course Parameters.

- Agriculture
- Communication Technology
- Community Health
- Construction Technologies
- Cosmetology Studies
- Design Studies
- Electro-Technologies
- Energy and Mines
- Fabrication Studies
- Fashion Studies
- Foods
- Forestry
- Information Processing
- Logistics
- Management and Marketing
- Mechanics
- Wildlife

Each set of parameters describes key features of the learning environment that need to be in place to support effective learning. The parameters provide:

- general information regarding facilities and equipment, safety considerations, instructional qualifications and credentialling opportunities for each strand
- specific requirements and recommendations regarding facilities, equipment, instructional qualifications and credentialling for each course.

---

★Includes only those CTS strands that require specialized facilities, equipment and/or instructional qualifications.

The strand and course parameters apply to courses delivered in the school and through off-campus learning. In general, the parameters identify more requirements for course delivery at the intermediate- and advanced-level than at the introductory-level.

## FACILITIES AND EQUIPMENT

Specialized facilities and equipment are identified for courses when their use is recommended for:

- delivering one or more of the learner outcomes
- maintaining appropriate levels of safety
- providing credentialling opportunities or articulation with post-secondary training programs.

In some instances particular facilities and equipment are recommended as necessary to meet the outcomes of the course, while in other instances they are identified as optional in providing student access to supportive learning environments. Where appropriate, facility and equipment requirements for offering commercial programs are also identified, as in the Foods strand.

## SAFETY CONSIDERATIONS

Refer to Appendix 3: Addressing Health and Safety in CTS.

General guidelines for promoting a safe learning and teaching environment are also provided through the strand and course parameters. Safety guidelines focus attention on safety awareness and the demonstration of safe practices, and in some instances identify specific elements that need to be in place to support safe learning.

**Recommendations regarding safety and risk management are general in nature, and do not in any way replace the expert advice required in specific circumstances.**

## INSTRUCTIONAL QUALIFICATIONS

Instructional qualifications over and above a professional teaching certificate are identified for courses that require special technical expertise or special safety precautions. Instructional qualifications required may include:

- a specific credential granted by business, industry, government or a community organization; e.g., journeyman certificate, Alberta Best Trainer, First Aid certificate
- evidence of successful completion of a specialized training program or equivalent; e.g., a workshop/course from a technical institute/college/university, a session at the CTS Leadership Seminar.

In some instances the instructional qualifications are a requirement for course delivery, such as when learning involves high risk to student safety. In other instances they are recommended for specific circumstances, such as when providing customer services or in qualifying students to obtain a credential.

### CREDENTIALLING OPPORTUNITIES

Refer to *Appendix 5: Planning Ahead—CTS Transitions into Post-Secondary and the Workplace.*

The course parameters also identify courses that offer students the opportunity to earn partial or complete credentials recognized in the workplace or by post-secondary institutions. Credentials provide written evidence by agencies external to the school of a student's qualifications with respect to particular competencies.

Credentialling opportunities are not limited to those identified through the course parameters, and depend on resources available in local and neighbouring communities. Schools may choose to use this information as a basis for further research and for planning regarding credentials they wish to offer students.

## DEVELOPING FACILITIES TO SUPPORT CTS

Developing CTS facilities is a collaborative process involving teachers, administrators, students and the community. Decisions regarding facilities and equipment are made on the basis of student need, knowledge of the curriculum and further education/workplace opportunities.

Those involved in planning for the construction of new facilities or renovations to existing facilities should contact the School Facilities Branch for guidelines on developing facilities to support CTS.

### PLANNING PRINCIPLES

Refer to Attachment 2: Developing a Facility Improvement Plan.

When planning CTS facilities at the school and school system level, consideration should be given to:

- the safety of students and staff and care of the environment
- facilities and space that support the achievement of desired learner outcomes
- facilities that are flexible and adaptable to accommodate change
- facilities that accommodate a variety of learning styles and teaching methodologies
- extending school programs and courses through the use of community partnerships and off-campus learning
- demographic trends regarding long-term use of facilities.

## GUIDELINES FOR NEW CONSTRUCTION AND MODERNIZATION

As teaching and learning in CTS is student centered and involves a broad base of resource support, facilities should be adapted to meet a range of student and community needs. Instructional spaces should become larger and more flexible. Larger spaces can be subdivided into work stations, research centres, computer centres and seminar rooms, thus allowing for individual and group work across a range of instructional areas in CTS. As schools expand their delivery of CTS, students may also spend more time outside the physical boundaries of the school, accessing resources found in the community.

Refer to Attachment 3: Sample Checklist for Facility Planning.

The following processes are recommended when planning for new construction or modernization projects at the school level:

- identify specific educational outcomes to be achieved, ensuring alignment with the school/school system mission, needs of students and local resources
- determine which CTS strands and courses are to be offered by or in the school
- inventory existing space within the school and community that can be used, as it exists, to achieve educational outcomes and deliver CTS strands and courses
- identify new space that may be required to achieve educational outcomes and deliver CTS strands and courses
- consider the proximity of instructional spaces to one another and how they are likely to be used by teachers and students
- determine millwork, furniture, equipment and services required to deliver the learner outcomes
- identify ambient features important to the learning environment.

## CTS IN STANDARD CLASSROOM SETTINGS

Refer to Attachment 4: CTS without Labs.

While many CTS courses cannot be delivered effectively unless the student has access to hands-on learning, either in a lab or worksite setting, others are more theory based and can be readily delivered in standard classroom settings. CTS courses suitable for delivery in a standard classroom assume access to appropriate learning and teaching resources, and may also require that students:

- gain practical experiences through participation in field trips
- use computer simulations and other multimedia software.

## EXPANDING STUDENT ACCESS TO CTS

Student access to the CTS program can be expanded considerably through the efficient use of facilities and equipment and taking advantage of alternative delivery strategies, on- and off-campus. The following questions are provided to provoke thought about how course delivery might be expanded.

### USE OF FACILITIES AND EQUIPMENT

What courses are presently being offered?

*When making the transition into CTS, it may be possible that a particular facility could support the delivery of courses from strands other than those currently being considered.*

Which additional courses could be offered:

- in this facility?
- in an adjacent facility?

Is there adequate technical support?

*Teachers who are extensively involved in setting up, maintaining and repairing the technology are often unable to invest sufficient time in organizing for learning, working directly with students and assessing their competencies.*

Are there alternative facilities and equipment available:

- in the community, from business, industry, central office, and the like?
- through neighboring schools and school systems, post-secondary institutions, and other partners?

### USE OF DISTANCE EDUCATION TECHNOLOGY

The use of information, communication and multimedia technologies can be another effective means of expanding access to a range of relevant CTS courses for all students.

Could distance education technologies be used to:

- help students learn difficult concepts?
- deliver instruction in new areas where there may be a lack of teacher expertise?

While distance education can be a valuable alternative for expanding student access to some CTS courses, care is needed in selecting courses to be delivered by these technologies. Many CTS courses focus on the development of workplace competencies and require students to link theory with practice in real-life contexts. *These courses cannot be effectively delivered unless the student has access to hands-on learning, either in a lab or worksite setting, and appropriate levels of technical expertise.*

Attachment 1

## Strand and Course Parameters★

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★Includes only those CTS strands th require specialized facilities, equipment and/or instructional qualifications.

## Course Parameters for Agriculture

### Facilities

Some courses in the Agriculture scope and sequence can be delivered in a typical classroom setting. Others require access to more specialized in-school and off-campus facilities, such as:

- a land laboratory or outdoor environment
- science, design, construction, fabrication and mechanics laboratories
- controlled growing environments with adequate ventilation suited to plant or livestock production
- lighting capabilities conducive to horticulture
- observation and training sites sponsored by relevant industry, government or post-secondary agencies
- resource centres equipped with computers, software and audio-visual material.

Also desirable, though not essential, are instructional facilities that have:

- water and sinks
- display and storage areas for specimens and artifacts
- whiteboards/bulletin boards
- fresh air and fume extraction
- an exterior exit
- telephone service.

Courses that require access to facilities in addition to those present in a typical classroom setting are identified in the Course Parameters. For more information, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

### Equipment

An equipment list for each course in the scope and sequence is provided in the Course Parameters chart. Though not exhaustive, the list identifies recommended and optional equipment for meeting the outcomes of the courses.

Equipment for courses in Agriculture can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers may find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each course.

### Safety Considerations

Facilities used to support an Agriculture program must ensure a safe learning/working environment. Students must be aware of federal, provincial and local regulations governing the tasks they perform, and adhere to appropriate personal and environmental health and safety procedures in courses that involve:

- the use of specialized hand/power equipment
- the handling and storage of hazardous materials
- practical skills in animal care.

Students must understand immediate and potential hazards associated with the tasks they perform, and the possible impact of these hazards on self, others and the environment.

### Instructional Qualifications

Courses in Agriculture can be implemented by Alberta Certified Teachers who have interest in providing instruction in classroom, laboratory and/or outdoor environments. A background in science, social studies or a relevant industry, such as plant/animal production, animal husbandry, interior/exterior plantscape, floristry, agrifoods, market development or environmental management is an asset to those who provide instruction in Agriculture courses, particularly at the intermediate and advanced levels. Teachers may find it desirable to access sources of instructional support available from industry, professional associations and consultants, Alberta Agriculture, Food and Rural Development and other relevant government agencies.

### Credentialling Opportunities

Some courses within the Agriculture strand provide opportunities for students to earn either complete or partial credentials recognized by business, industry and/or post-secondary institutions. Courses that link with credentialling opportunities relevant to the agriculture or horticulture sectors are identified in the Course Parameters chart. For more information regarding the credential, requirement/qualification and credentialling agency, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation.*

## Course Parameters

**AGRICULTURE**

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Social and Cultural Perspectives
B. Technology and Applications
C. Management and Conservation

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | B | B | B | B | B | B | C | A | B | B | B | B | B | B | B | B |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | | | |
| INSTRUCTIONAL FACILITIES | | * | | * | * | | * | | * | * | * | | * | * | * | | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | * | * | | * | | | | |
| EQUIPMENT | Agriculture: The Big Picture | Production Basics | Consumer Products & Services | Basic Landscape/Turf Care | Basic Floral Design | Market Fundamentals | Agriculture Technology | Resource Management | Animal Husbandry/Welfare | Field Crops 1 | Livestock/Poultry 1 | Agrifoods 1 | Landscape/Turf Management 1 | Equine 1 | Floral Design 1 | Marketing 1 | Protected Structures |
| | 1010 | 1030 | 1060 | 1070 | 1080 | 1090 | 1100 | 1110 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 |
| Autoclave | | | | | | | | | | O | | | | | | | O |
| Computers and software (1) | | | | O | O | O | O | | O | O | O | | O | O | O | O | O |
| Floral equipment and materials (2) | | | | | ✓ | | | | | | | | | | ✓ | | |
| Heating coil and controller | | O | | | | | | | | | | | | | | | |
| Landscape equipment, hand (3) | | O | | ✓ | | | | | | | | | ✓ | | | | |
| Landscape equipment, power (4) | | | | ✓ | | | | | | | | | ✓ | | | | |
| Lighting equipment (5) | | O | | | ✓ | | | | | | | | | | ✓ | | O |
| Maps, hydrogeological | | | | | | | | | | | | | | | | | |
| Maps, soil | | | | | | | | | | | | | | | | | |
| Meter, electrical conductivity | | | | | | | | | | | | | | | | | |
| Meters, pH | | | | | | | | O | | | | | | | | | |
| Microscope | | O | | ✓ | | | | O | | ✓ | O | O | ✓ | | | | |
| Plant propagation materials (6) | | O | | ✓ | ✓ | | | | | ✓ | | | ✓ | | ✓ | | |

| LEVEL | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | C | C | B | A | B | B | B | B | B | B | B | B | C | C | C | B |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | | |
| INSTRUCTIONAL FACILITIES | * | * | * | | * | * | | * | * | * | | * | | * | | * |
| CREDENTIALLING OPPORTUNITIES | * | | | | * | * | | * | | | | | | * | | |
| EQUIPMENT | Soils Management 1 | Integrated Pest Management | Nursery/Greenhouse Crops 1 | Issues in Agriculture | Field Crops 2 | Livestock/Poultry 2 | Agrifoods 2 | Landscape/Turf Management 2 | Equine 2 | Floral Design 2 | Marketing 2 | Biotechnology | Water Management | Soils Management 2 | Sustainable Agriculture Systems | Nursery/Greenhouse Crops 2 |
| | 2120 | 2130 | 2140 | 3010 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 |
| Autoclave | | | O | | O | | | | | | | | | | | O |
| Computers and software (1) | | | O | | O | O | O | O | O | O | O | | | | | O |
| Floral equipment and materials (2) | | | | | | | | | | ✓ | | | | | | |
| Heating coil and controller | | | O | | O | | | | | | | | | | | O |
| Landscape equipment, hand (3) | | | ✓ | | ✓ | | | ✓ | | | | | | | | ✓ |
| Landscape equipment, power (4) | | | O | | O | | | ✓ | | | | | | | | O |
| Lighting equipment (5) | | | O | | O | | | | | O | | | | | | O |
| Maps, hydrogeological | | | | | | | | | | | | | ✓ | | | |
| Maps, soil | ✓ | | | | | | | | | | | | | ✓ | | |
| Meter, electrical conductivity | ✓ | | | | O | | | | | | | | | ✓ | | O |
| Meters, pH | ✓ | | | | O | | | | | | | | | ✓ | O | O |
| Microscope | | | ✓ | | O | O | O | O | | | | | | | | O |
| Plant propagation materials (6) | ✓ | | ✓ | | ✓ | | | ✓ | | | | | | ✓ | | ✓ |

(1) Computer software may include breeding records, financial management, design and layout, marketing databases as required.
(2) Floral equipment and materials include glue gun, netting, spray paint, water picks, pins, ribbon, floral foams, tape, knives, floral shears, wire, assorted florals, packaging materials, floral containers.
(3) Hand landscape equipment includes hoe, rake shovel, trowel, spade, wheelbarrow, garden fork.
(4) Power landscape equipment includes aerator, lawn mower, lawn rake, rototiller.
(5) Lighting equipment may include tungsten filament lamps, fluorescent lamps, high intensity discharge lamps and timers as required.
(6) Plant propagation materials include plant pots/containers, growing media, soil amendments, fertilizer, rooting hormone.

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Social and Cultural Perspectives
B. Technology and Applications
C. Management and Conservation

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | B | B | B | B | B | B | C | A | B | B | B | B | B | B | B | B | C | C |  | A | B | B | B | B | B | B | B | B | C | C | C | B |
| INSTRUCTIONAL QUALIFICATIONS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| INSTRUCTIONAL FACILITIES |  | * |  | * | * |  | * |  | * | * | * |  | * | * | * |  | * | * | * | * |  | * | * |  | * | * | * |  | * |  | * |  | * |
| CREDENTIALLING OPPORTUNITIES |  |  |  |  |  |  |  |  |  | * | * |  | * |  |  |  |  | * |  |  |  | * | * |  | * |  |  |  |  |  | * |  |  |
| EQUIPMENT | Agriculture: The Big Picture | Production Basics | Consumer Products & Services | Basic Landscape/Turf Care | Basic Floral Design | Market Fundamentals | Agriculture Technology | Resource Management | Animal Husbandry/Welfare | Field Crops 1 | Livestock/Poultry 1 | Agrifoods 1 | Landscape/Turf Management 1 | Equine 1 | Floral Design 1 | Marketing 1 | Protected Structures | Soils Management 1 | Integrated Pest Management | Nursery/Greenhouse Crops 1 | Issues in Agriculture | Field Crops 2 | Livestock/Poultry 2 | Agrifoods 2 | Landscape/Turf Management 2 | Equine 2 | Floral Design 2 | Marketing 2 | Biotechnology | Water Management | Soils Management 2 | Sustainable Agriculture Systems | Nursery/Greenhouse Crops 2 |
|  | 1010 | 1030 | 1060 | 1070 | 1080 | 1090 | 1100 | 1110 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2120 | 2130 | 2140 | 3010 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 |
| Protective clothing (7) |  | O | O | ✓ | ✓ |  | O |  | ✓ | ✓ | ✓ | O | ✓ | ✓ | ✓ |  | O | O | ✓ | ✓ |  | ✓ | ✓ | O | ✓ | ✓ | ✓ |  | O |  | O |  | ✓ |
| Pruning tools |  | O |  | ✓ | O |  |  |  |  | ✓ |  |  | ✓ |  | ✓ |  |  |  |  | ✓ |  | O |  |  | ✓ |  | ✓ |  |  |  |  |  | ✓ |
| Refrigerator |  | O | O | O | ✓ |  |  |  |  |  |  | O | O |  | ✓ |  |  |  |  | O |  | O |  | O | O |  | ✓ |  |  |  |  |  | O |
| Riker (permanent display) mounts |  | O | O | O | O |  |  | O |  | O | O | O | O |  | O |  |  |  | O | O |  | O | O | O | O |  | O |  |  |  |  |  | O |
| Samples: agriculture commodity | ✓ | ✓ | ✓ |  |  |  |  |  |  | ✓ | ✓ | ✓ |  |  |  |  |  |  |  |  |  | ✓ | ✓ | ✓ |  |  |  |  |  |  |  |  |  |
| feed |  | O |  |  |  |  |  |  | ✓ |  | ✓ |  |  | ✓ |  |  |  |  |  |  |  |  | ✓ |  |  | ✓ |  |  |  |  |  |  |  |
| fertilizer |  | O |  | ✓ |  |  |  |  |  | ✓ |  |  | ✓ |  |  |  |  |  |  | ✓ |  | ✓ |  |  | ✓ |  |  |  |  |  |  |  | ✓ |
| pesticide |  | O |  | ✓ |  |  |  | ✓ |  | ✓ |  |  | ✓ |  |  |  | O |  | ✓ | ✓ |  | ✓ |  |  | ✓ |  |  |  |  |  |  |  | ✓ |
| seed |  | O |  | O |  |  |  |  |  | ✓ |  |  | O |  |  |  |  |  |  | ✓ |  | ✓ |  |  | O |  |  |  |  |  |  |  | ✓ |
| soil |  |  |  | O |  |  |  | O |  | O |  |  | O |  |  |  | O | ✓ |  | ✓ |  | O |  |  | O |  |  |  |  |  | ✓ |  | ✓ |
| Slides/specimens, plant and animal (8) | ✓ | O | ✓ | ✓ | ✓ |  |  |  | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  |  |  |  | ✓ |  | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  |  |  |  |  | ✓ |
| Sprayer, chemical |  |  |  | O |  |  |  |  |  | O |  |  | O |  |  |  | O |  | O | O |  | O |  |  | O |  |  |  |  |  |  |  | O |
| Tables, media mixing |  | O |  | O |  |  |  |  |  |  |  |  | O |  |  |  |  |  |  | O |  |  |  |  | O |  |  |  |  |  |  |  | O |

(7) Protective clothing may include rubber/steel-toed boots, gloves, protective eyewear, coveralls, rubber pants and jacket as required.
(8) Slides/specimens may include plant or animal structures, pests and diseases as required.

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

LEVEL
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2 – Intermediate
3 – Advanced

THEME
A. Social and Cultural Perspectives
B. Technology and Applications
C. Management and Conservation

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | B | B | B | B | B | B | C | A | B | B | B | B | B | B | B | B | C | C | | A | B | B | B | B | B | B | B | B | C | C | C | B |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| INSTRUCTIONAL FACILITIES | | * | | * | * | | * | | * | * | * | | * | * | * | | * | * | * | * | | * | * | | * | * | * | | * | | * | | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | * | * | | * | | | | | * | | | | * | * | | * | | | | | | * | | |
| **EQUIPMENT** | Agriculture The Big Picture | Production Basics | Consumer Products & Services | Basic Landscape/Turf Care | Basic Floral Design | Market Fundamentals | Agriculture Technology | Resource Management | Animal Husbandry/Welfare | Field Crops 1 | Livestock/Poultry 1 | Agrifoods 1 | Landscape/Turf Management 1 | Equine 1 | Floral Design 1 | Marketing 1 | Protected Structures | Soils Management 1 | Integrated Pest Management | Nursery/Greenhouse Crops 1 | Issues in Agriculture | Field Crops 2 | Livestock/Poultry 2 | Agrifoods 2 | Landscape/Turf Management 2 | Equine 2 | Floral Design 2 | Marketing 2 | Biotechnology | Water Management | Soils Management 2 | Sustainable Agriculture Systems | Nursery/Greenhouse Crops 2 |
| | 1010 | 1030 | 1060 | 1070 | 1080 | 1090 | 1100 | 1110 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2120 | 2130 | 2140 | 3010 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 |
| Tables, seedage | | O | | O | | | | | | | | | O | | | | | | | O | | | | | O | | | | | | | | O |
| Water culture containers | | | | | | | | | | O | | | | | | | O | | | O | | O | | | | | | | | | | | O |
| Water distiller/deionizer | | | | O | | | | | | O | | | O | | | | | ✓ | | O | | O | | | O | | | | | O | ✓ | | O |
| Watering equipment (9) | | O | | ✓ | ✓ | | | | | ✓ | | | ✓ | | ✓ | | | | | ✓ | | ✓ | | | ✓ | | ✓ | | | | | | ✓ |
| Weigh scales | | | | | | | | | | ✓ | O | | | O | | | | O | | ✓ | | ✓ | O | | | O | | | | | O | | ✓ |

(9) Watering equipment includes hoses, water sprinklers/sprayers, watering cans.

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters for Communication Technology

### Facilities

Some courses in the Communication Technology scope and sequence can be delivered in a typical classroom setting. Refer to Attachment 4: CTS without Labs in this appendix. Others require access to more specialized in-school or off-campus facilities. These might include:

- storage areas
- water and sinks
- whiteboards/bulletin boards
- fresh air and fume extraction
- an exterior exit
- telephone/data line service
- darkroom(s).

Courses that require access to facilities in addition to those present in a typical classroom setting are identified in the Course Parameters. For more information, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

The type of facility and equipment required for the Communication Technology strand is determined by the nature and scope of the program being offered. The current Visual Communication program requires specialized darkroom facilities including water, fume ventilation and specialized power. With the advent of digital photography, the darkroom can be viewed as an option, at least at the introductory and intermediate levels of the strand; however, some of the program outcomes identified at the advanced level require a darkroom facility. The print theme requires specialized ventilation and access to water for cleaning of equipment, as well as a chemical storage cupboard required for inks, solvents, etc.

### Equipment

A recommended equipment list for each course in the scope and sequence is provided in the Course Parameters chart. Though not exhaustive, the list identifies equipment recommended as necessary to meet the course outcomes.

Programs offering audio/video production require video cameras and one or more editing facilities depending on student demand. Some schools have addressed the audio/video theme with minimal equipment; others have provided full television studio facilities, complete with advanced cameras and state-of-the-art switching and editing capabilities. Some Communication Technology sites produce programs for their school, school system and community, including production for their local cable networks. It may be possible for students to access more advanced equipment and facilities through local television/radio, printing shops, photography studios, design studios and other community sources, reducing the need for high end facilities in the school.

Equipment for courses in Communication Technology can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers may find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each course.

### Safety and Security Considerations

Safety and security issues in Communication Technology depend on the scope of the program provided. Safety with respect to the use of equipment, materials and supplies is particularly important in photography and print themes, due to processing chemicals, fumes from printing ink, paper cutters, press and bindery equipment. Steps should also be taken to lock up solvents and inks in a fireproof cabinet and to secure power supply through a lockout mechanism.

### Instructional Qualifications

Courses in Communication Technology can be implemented by Alberta Certified Teachers who have interest in providing instruction in classroom and/or laboratory environments. A background in design, art, English or relevant industry is an asset to those who provide instruction in Communication Technology courses, particularly at the intermediate and advanced levels. Teachers may find it desirable to access sources of instructional support available from industry, professional associations and consultants, and relevant government agencies.

Communication Technology addresses four major themes: presentation, photography, print, audio/video/digital. Its foundation is the current Visual Communication program; teachers of this program have much of the background necessary to offer the strand. Teachers of Fine Arts, Visual Communication and Industrial Arts may find a transition into Communication Technology relatively easy, as they have had some experience with the content and the conceptual framework. Communication Technology teachers require some technical background in one or more of the themes to teach the program effectively, particularly in the photography, print and audio/video/digital themes. Due to the scope of the program, additional training through university, college or technical schools would be beneficial. Formal design, photography, audio/video and print graphics training are advantageous in the related courses.

### Credentialling Opportunities

There is a formal articulation to the Graphic Arts Craftsman trade through the printing theme of Communication Technology. While this theme provides some background for students in the area, there are no credentialling opportunities identified at this time.

## Course Parameters

## COMMUNICATION TECHNOLOGY

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Presentation
B. Photography
C. Print
D. Audio/Video/Digital

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | B | C | D | D | D | A | A | A | B | B | B | C | C | D | D | D | D | B | A | A | A | B | B | B | B | C | C | D | D | D | D |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| INSTRUCTIONAL FACILITIES | | * | * | * | * | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | | * | | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **EQUIPMENT** | Presentation & Communication 1 | Media & You | Photography 1 | Printing 1 | Audio/Video Production 1 | Animation 1 | Digital Design 1 | Presentation & Communication 2 | Media Design & Analysis 1 | Script Writing 1 | Photography 2 | Photographic Communication | Photographic Techniques 1 | Printing Techniques 1 | Printing Applications 1 | Audio/Video 1 | Audio/Video 2 | Animation 2 | Digital Design 2 | Special Effects Photography | Presentation & Communication 3 | Media Design & Analysis 2 | Script Writing 2 | Photography 3 | Photojournalism | Photographic Techniques 2 | Colour Photography | Printing Techniques 2 | Printing Applications 2 | Audio 3 | Video 3 | Animation 3 | Digital Design 3 |
| | 1010 | 1020 | 1030 | 1050 | 1060 | 1070 | 1080 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2110 | 2120 | 2130 | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 |
| Audio recorder(s) | ✓ | ✓ | | | ✓ | | | ✓ | ○ | | | ✓ | | | | ✓ | ✓ | | | | ✓ | ✓ | | | | | | | | ✓ | | | |
| Camcorder(s) | ✓ | ✓ | | | ✓ | ○ | ✓ | ✓ | ✓ | | | | | | | ✓ | ✓ | | ✓ | | ✓ | ✓ | | | | | | | | | ✓ | | ✓ |
| Camera (animation) | | | | | | ✓ | | | ○ | | | | | | | | | ✓ | | | ✓ | | | | | | | | | | ✓ | ✓ | |
| Camera(s) (still) | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | | ○ | | | | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ |
| CD player | | ✓ | | | | | ✓ | ✓ | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | | | | | | | ✓ | ✓ | ✓ | ✓ |
| CD player (photo) | ✓ | ○ | | | | | ✓ | ○ | | | | ✓ | | | | | ✓ | ✓ | ✓ | | ✓ | ✓ | | | | | | | | | ✓ | ✓ | ✓ |
| CDROM player | | ○ | | | | | ✓ | | ○ | | | ○ | | | | | | ✓ | ✓ | | | | | | | | | | | | ✓ | ✓ | ✓ |
| Computer(s) | ✓ | ✓ | ✓ | ✓ | ✓ | ○ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Darkroom and accessories | | ○ | ○ | | | | | | | | ✓ | ✓ | ✓ | ○ | ○ | | | | | ✓ | | ○ | | ✓ | ✓ | ✓ | ✓ | | | | | | |
| Display boards | ✓ | ○ | ○ | ✓ | | | | | ○ | | ○ | ○ | ○ | ○ | ○ | | | | | ○ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | |
| Editing room | | | | | ○ | | | | | | | | | | | ✓ | ✓ | | | | | | | | | | | | | | ✓ | | |
| Editor | | ○ | | | ○ | | | | | | | ○ | | | | ✓ | ✓ | ✓ | | | | | | | | | | | | | ✓ | ✓ | |
| Laserdisc player | | ○ | | | | | ✓ | | ○ | | | ✓ | | | | | ✓ | | ✓ | | ✓ | ✓ | | | | | | | | | | ✓ | ✓ |
| Layout/drafting table(s) | | ○ | | ✓ | | | | | ✓ | | | ✓ | | ✓ | ✓ | | | ✓ | | | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | | | ✓ | |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

### COMMUNICATION TECHNOLOGY

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Presentation
B. Photography
C. Print
D. Audio/Video/Digital

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| | Presentation & Communication 1 | Media & You | Photography 1 | Printing 1 | Audio/Video Production 1 | Animation 1 | Digital Design 1 | Presentation & Communication 2 | Media Design & Analysis 1 | Script Writing 1 | Photography 2 | Photographic Communication | Photographic Techniques 1 | Printing Techniques 1 | Printing Applications 1 | Audio/Video 1 | Audio/Video 2 | Animation 2 | Digital Design 2 | Special Effects Photography | Presentation & Communication 3 | Media Design & Analysis 2 | Script Writing 2 | Photography 3 | Photojournalism | Photographic Techniques 2 | Colour Photography | Printing Techniques 2 | Printing Applications 2 | Audio 3 | Video 3 | Animation 3 | Digital Design 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | B | C | D | D | D | A | A | A | B | B | B | C | C | D | D | D | D | B | A | A | A | B | B | B | B | C | C | D | D | D | D |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| INSTRUCTIONAL FACILITIES | * | | | * | * | * | * | * | | | * | * | * | * | * | * | * | * | * | * | * | | | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EQUIPMENT | 1010 | 1020 | 1030 | 1050 | 1060 | 1070 | 1080 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2110 | 2120 | 2130 | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 |
| Light table(s) | | ○ | | ✓ | | ○ | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | | | ✓ | ✓ | ○ | ✓ | | | | | | |
| Microphones | | | | | ○ | | | ✓ | | | | ○ | | | | ✓ | ✓ | | | | ✓ | | | | | | | | | ✓ | ✓ | ✓ | |
| Mixer | | ○ | | | ○ | | | | | | | ○ | | | | ✓ | ✓ | | | | | | | | | | | | | ✓ | ✓ | ✓ | |
| Paper cutter | | | | ✓ | | | | | ○ | | | | ✓ | ✓ | ✓ | | | | | | | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| Photocopier | ○ | | | ○ | | | | | ○ | | | | | ○ | ○ | | | | | | | ○ | | | | | | ✓ | ✓ | | | | |
| Photo enlarger(s) | | ○ | ○ | | | | | | | | ✓ | ✓ | ✓ | | | | | | | ✓ | | ○ | | ✓ | ✓ | ✓ | ✓ | | | | | | |
| Printer | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Projector, 16mm | | | | | | ✓ | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | ✓ | |
| overhead | ✓ | ○ | | | | | | ✓ | | | | | | | | | | | | | ✓ | | | | | | | | | | | ○ | |
| slide | ✓ | ○ | | | | | | ✓ | ○ | | ✓ | ✓ | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | ○ | |
| Recording booth | | | | | ○ | | | ✓ | | | | | | | | ✓ | ✓ | | | | | | | | | | | | | ✓ | ✓ | | |
| Scanner | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Screen | ✓ | ○ | | | | | | ✓ | ○ | | ✓ | ✓ | | | | | | ✓ | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | |
| Screen printing equipment | | | | ○ | | | | | | | | | | ○ | ○ | | | | | | | | | | | | | ✓ | ✓ | | | | |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## COMMUNICATION TECHNOLOGY

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Presentation
B. Photography
C. Print
D. Audio/Video/Digital

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | A | B | C | D | D | D | A | A | A | B | B | B | C | C | D | D | D | D | B | A | A | A | B | B | B | B | C | C | D | D | D | D |
| INSTRUCTIONAL QUALIFICATIONS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| INSTRUCTIONAL FACILITIES | * |  |  | * | * | * | * | * |  |  | * | * | * | * | * | * | * | * | * | * | * |  |  | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **EQUIPMENT** | Presentation & Communication 1 | Media & You | Photography 1 | Printing 1 | Audio/Video Production 1 | Animation 1 | Digital Design 1 | Presentation & Communication 2 | Media Design & Analysis 1 | Script Writing 1 | Photography 2 | Photographic Communication | Photographic Techniques 1 | Printing Techniques 1 | Printing Applications 1 | Audio/Video 1 | Audio/Video 2 | Animation 2 | Digital Design 2 | Special Effects Photography | Presentation & Communication 3 | Media Design & Analysis 2 | Script Writing 2 | Photography 3 | Photojournalism | Photographic Techniques 2 | Colour Photography | Printing Techniques 2 | Printing Applications 2 | Audio 3 | Video 3 | Animation 3 | Digital Design 3 |
|  | 1010 | 1020 | 1030 | 1050 | 1060 | 1070 | 1080 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2110 | 2120 | 2130 | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 |
| Special FX generator |  |  |  |  |  | O | ✓ |  |  |  |  |  |  |  |  | ✓ | ✓ |  | ✓ |  |  |  |  |  |  |  |  |  |  |  | ✓ | ✓ | ✓ |
| Storage cabinet(s) | O | O | ✓ | ✓ | ✓ |  |  |  | O |  | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  | ✓ |  |  |  | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  | ✓ |  |  |
| Tripod/dolly |  |  |  |  | ✓ | ✓ |  | O | ✓ |  | ✓ |  |  |  |  | ✓ | ✓ | ✓ |  | ✓ | ✓ |  |  | ✓ | ✓ | ✓ | ✓ |  |  |  | ✓ |  |  |
| VCR/monitors |  | ✓ |  |  | ✓ | ✓ | ✓ | ✓ | ✓ |  |  | O |  |  |  | ✓ | ✓ | ✓ | O |  | ✓ | ✓ |  |  |  |  |  |  |  |  | ✓ | ✓ | ✓ |
| Video production room |  |  |  |  | O |  |  |  |  |  |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ | ✓ |  |
| Work/animation table(s) |  | O |  |  |  | ✓ |  |  | ✓ |  |  |  |  | ✓ | ✓ |  |  | ✓ |  |  | ✓ | ✓ |  |  |  |  |  | ✓ | ✓ |  |  | ✓ |  |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters for Community Health

### Facilities

The majority of the Community Health strand can be successfuught in a classroom/community setting without special facilities. :r to Attachment 4: CTS without Labs in this appendix. When plg or selecting a facility for Community Health, ensure access to:

- adequate space for instruction
- existing in-school facilities used for science or Home Ecocs—water and sinks
- relevant business, industry and government facilities availan the community and province
- a resource centre that includes computer hardware and sofe, as well as storage for print and audio-visual material.

Also desirable, though not essential, are classroom facilities that ude:

- stoves, washer and dryer
- display and storage areas
- whiteboards/bulletin boards
- telephone service.

Courses that require access to facilities in addition to those pret in a typical classroom setting are identified in the Course Paramet. For more information, see the corresponding course in Sections D, Ed F of the *Guide to Standards and Implementation*.

### Equipment

A recommended equipment list is provided in the course paramet chart. Though not exhaustive, the list identifies equipment recommded as necessary to meet the outcomes of the courses. Teachers mafind it desirable to develop a list of small equipment and materials that dresses the needs of specific learning activities planned within each cours

Equipment needs may be addressed through purchasing, borrowing, renting and constructing. When choosing among options for obtaining equipment, give consideration to:

- adequacy of budgets for purchase of equipment
- in-school maintenance and storage capabilities
- the logistics and cost of renting
- potential for loan of equipment from other organizations
- joint purchases with other organizations or in-school departments
- opportunities for locally constructing some equipment.

### Safety Considerations

Facilities used to support the Community Health program must ensure a safe learning/working environment. Students must be aware of federal, provincial and local regulations governing the tasks they perform, and adhere to appropriate personal health/safety procedures in courses that involve:

- the handling and storage of hazardous materials
- the proper cleaning and maintenance of equipment and supplies
- practical skills involving client care
- off-campus learning.

Students must understand the importance of maintaining and promoting health and safety for themselves and others in all aspects of daily living.

### Instructional Qualifications

Teachers involved in the planning and delivery of an effective Community Health program are assumed to have Alberta certification with instructional expertise and interests in the areas of family studies or health care. First aid and health care training/experience and a background in science are assets in delivering some of the courses especially at the intermediate and advanced levels. Teachers may find it desirable to form partnerships with the first aid and other relevant community agencies.

To ensure compliance with industry and/or safety standards, some courses require that instruction be provided by a person(s) having additional credentials recognized by business, industry, government or community organizations. Courses requiring additional instructor credentials are identified in the Course Parameters chart. For more information, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

### Credentialling Opportunities

Students may earn credentials recognized by business, industry and/or post-secondary institutions by demonstrating specified competencies. Courses that link with credentialling opportunities relevant to Community Health are identified in the course parameters chart. For more information regarding the credential, requirement/qualification and credentialling agency, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

### Community Sensitivities

Some topics addressed in the Community Health strand are of a sensitive nature; e.g., human sexuality, dealing with loss. Teachers should adhere to provincial and system policies, ensure that parents are aware of the topics to be addressed and, where appropriate, obtain parental permission.

## Course Parameters

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Sociocultural Perspectives
B. Skills for Caring
C. Health Sciences
D. Injury Prevention

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| LEVEL | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | B | B | B | C | A | A | A | B | B | C | C | C | C | C | D | D | A | A | A | B | B | B | B | C | C | C | C | D | D |
| INSTRUCTIONAL QUALIFICATIONS | | * | | | | | | | | * | * | | | | | * | * | | | | | | * | | | | | | * | * |
| INSTRUCTIONAL FACILITIES | | | | * | | | | | | * | | | | | | | | | | | | | * | | | | | | | |
| CREDENTIALLING OPPORTUNITIES | | * | | | | | | | | | | | | | | * | * | | | | | * | | | | | | | * | |
| **EQUIPMENT** | Family Dynamics | Caring for Children | Child Development | Home Care 1 | Perspectives on Health | Adolescent Health Issues | Perspectives on Marriage | Community Volunteerism | Day Care 1 | Home Care 2 | Sensory Challenges | Respiratory System | Circulatory System | Musculoskeletal System | Complementary Therapies | First Aid/CPR | Sports First Aid 1 | Family Issues | Parenting | Aging | Prenatal & Postnatal Care | Day Care 2 | Home Care 3 | Challenged Individuals | Digestive System | Nervous/Endocrine Systems | Mental Health | Advances in Medical Technology | First Aid/CPR for Children | Sports First Aid 2 |
| | 1010 | 1040 | 1050 | 1060 | 1080 | 2010 | 2020 | 2030 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2110 | 2120 | 2130 | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 |
| Baby care items (1) | | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Child's play items and books | | O | O | | | | | | O | | | | | | | | | | | | | O | | | | | | | | |
| Consumables (2) | | | | ✓ | | | | | | ✓ | | | | | | ✓ | ✓ | | | | | | ✓ | | | | | | | ✓ |
| First aid supplies (3) | | ✓ | | O | | | | | | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | | | | | | ✓ | | | | | | ✓ | ✓ |
| Fridge | | O | O | ✓ | | | | | | ✓ | | | | | | | | | | | | | ✓ | | | | | | O | |
| Hospital furniture (4) | | | | O | | | | | | ✓ | | | | | | | | | | | | | ✓ | | | | | | | |
| Linens (5) | | ✓ | | ✓ | | | | | | ✓ | | | | | | | | | | | | | ✓ | | | | | | | |
| Medical personal care items (6) | | | | ✓ | | | | | | ✓ | | | | | | | | | | O | | | ✓ | | | | | | | |
| Models (7) | | | | ✓ | O | | | | | O | | O | ✓ | ✓ | | O | ✓ | | | | ✓ | | O | | ✓ | ✓ | O | | O | ✓ |
| Weighted baby | | O | O | | | | | | | | | | | | | | | | O | | O | | | | | | | | | |
| Wheelchair | | | | ✓ | | | | | | ✓ | | | | | | O | | | | | | | ✓ | | | | | | | |

(1) Baby care items include bottles, diapers
(2) Consumables include gloves, masks, straws, applicators, swabs, variety of bandages for various purposes, tape.
(3) First aid supplies may include blankets, first aid kit, CPR resuscitator, models, stretchers, splints.
(4) Hospital furniture items include hospital bed, bedside tables, overbed table, footstool, crib.
(5) Linens may include pillowcases, blankets, towels, drawsheets, bed protectors, gowns, sheets, pillows, face cloths.
(6) Medical personal care items include urinals, trays, water jug and cups, thermometers, eating aids, hot water bottle, ice packs, forceps and holders, pill containers, oral medical dispensers, stethoscopes, scissors, commode, bath thermometer, basins, bedpans, soap dish, denture cup, dispenser jars, sphygmomanometer.
(7) Models may include pelvic birthing models: skeletal, torso, heart, excretory, skin, brain, fetal, reproduction, joint, kidney.

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters for Construction Technologies

### Facilities

CTS programs centred around Construction Technologies should include courses that link with a facility or building site that is readily available in the school or in the community. When selecting or planning a facility for Construction Technologies, ensure:

- adequate space for instruction
- ample storage space for materials and projects
- adequate services to run the equipment
- provision for dust collection and fume extraction
- access to water and service doors
- appropriate ambient features that promote learning
- fire protection.

Courses that require access to facilities in addition to those present in a typical classroom setting are identified in the Course Parameters. For more information, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

### Equipment

A recommended equipment list is provided in the Course Parameters chart. Though not exhaustive, the list identifies equipment recommended as necessary to meet the course outcomes and equipment that is considered optional. Specific makes and models of equipment are to be determined at the local level.

Equipment for courses in Construction Technologies can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers may find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each course.

### Safety and Security Considerations

A number of safety issues relate to the maintenance and use of specialized power equipment, handling and storage of materials and behaviour of students while working in a shop environment. Extra care should be taken to ensure that facilities and equipment are well maintained and that students understand and practise safe work habits at all times. In addition, it is also important to have procedures in place to lock out gas and power service as well as to secure tools and material supplies.

### Instructional Qualifications

Due to the nature of the Construction Technologies strand, most courses require some form of specialized training provided primarily by recognized institutions responsible for occupational, technical or teacher preparation. Other forms of specialized training may also be provided through training seminars, workshops and other short courses. However, if a course is to be used to gain advanced standing in an apprenticeable trade, instruction must be provided by a teacher/instructor with journeyman qualifications.

Courses requiring additional instructor credentials are identified in the Course Parameters chart. See the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation* for further information regarding each instructor credential, specifically related to Explosive Actuated Tool Certification.

**Credentialling Opportunities**

Students may earn credentials recognized by business, industry and post-secondary institutions by demonstrating a specific set of competencies. Based on an articulation agreement established with the Apprenticeship and Industry Training Division, Alberta Advanced Education and Career Development, students who complete specified CTS courses may be eligible to obtain advanced standing in the apprenticeship program for Carpenter. Further details regarding each articulation agreement, including a correlation to CTS strands and courses, are provided in Appendix 5: Planning Ahead—CTS Transitions into Post-secondary Programs and the Workplace. Additional information can be obtained by contacting the Apprenticeship and Industry Training Division, Alberta Advanced Education and Career Development. A list of local Career Development Centres throughout Alberta is also provided in Appendix 5: Planning Ahead—CTS Transitions into Post-secondary Programs and the Workplace.

See Concrete Work (CON3010) in Section F of the *Guide to Standards and Implementation* for further information regarding instructor credential, specifically related to Explosive Actuated Tool Certification.

## Course Parameters

## *CONSTRUCTION TECHNOLOGIES*

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Building Systems (Processes and Applications)
B. Manufacturing Systems (Processes and Applications)

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | A | B | B | B | B | B | A | A | A | A | A | A | A | A | A | A | B | B | B | B | B | B | B | B | B |
| INSTRUCTIONAL QUALIFICATIONS | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **EQUIPMENT** | Basic Tools & Materials | Building Construction | Project Management | Solid Stock Construction | Turning Operations | Manufactured Materials | Mold Making & Casting | Site Preparation | Concrete Forming | Alternative Foundations | Framing Systems 1 | Roof Structures 1 | Exterior Finishing | Electrical Systems | Plumbing Systems | Climate Control Systems | Agri-structures | Multiple Materials | Furniture Making 1 | Furniture Making 2 | Finishing & Refinishing | Cabinetmaking 1 | Cabinetmaking 2 | Wood Forming | Manufacturing Systems | Product Development |
| | 1010 | 1070 | 1120 | 1130 | 1140 | 1160 | 1180 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 | 2180 | 2190 | 2200 |
| Basic set of hand tools (1) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Bench, equipment | ○ | ○ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ |
| Bench, woodworking | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Biscuit joiner | | | | ○ | | ○ | | | | | | | | | | | | ○ | ○ | ○ | | ○ | ○ | | | ○ |
| Cabinet, paint storage | ✓ | | ○ | ✓ | ✓ | ✓ | ○ | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ○ |
| Cleaner, vacuum | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | ○ |
| Compressor, air | | | | ○ | | ○ | ○ | | | | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | ○ | ○ | ○ | | ○ |
| Computer/printer | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Drill (variable, reversible) | ✓ | ○ | ○ | ○ | | ○ | ○ | | | ○ | | | ✓ | ✓ | ✓ | ✓ | ○ | ○ | ✓ | ✓ | ○ | ✓ | ✓ | ○ | | ○ |
| press (floor or bench) | ○ | ○ | ○ | ○ | | ○ | ○ | | | | | | | | | | ○ | ○ | ○ | ○ | | ○ | ○ | ○ | | ○ |
| set (imperial and metric) | ✓ | ○ | ○ | ○ | | ○ | ○ | | ○ | ○ | | | ✓ | ✓ | ✓ | ✓ | ○ | ○ | ✓ | ✓ | | ✓ | ✓ | ○ | | ○ |
| impact | | | | | | | | | ○ | | | | ○ | ○ | ○ | ○ | ○ | | | | | | | | | |

(1) A basic set of hand tools might include awl, sliding T bevel, sanding block, wood chisels, assorted clamps, compass, wood files, marking gauge, hammer, putty and utility knife, level, mallet, nail set, planes, pliers, plumb bob, ruler, coping, crosscut and rip saws, screwdrivers, squares and a tape measure.

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Building Systems (Processes and Applications)
B. Manufacturing Sy:esses and Applications)

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 3 | 3 | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | | | A | A | A | A | A | A | A | B | B | B | B | B | B | B | B | A |
| INSTRUCTIONAL QUALIFICATIONS | * | * | | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| INSTRUCTIONAL FACILITIES | * | * | | | * | * | * | | * | * | | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | * | | | | | | | | | | | | | | | | | | | |
| EQUIPMENT | Concrete Work | Masonry Work | Wall & Ceiling Finishing | Stair Construction | Roof Structures 2 | Doors & Trim | Floorcovering | Energy-efficient Housing | Renovations/Restorations | Commercial Structures | Site Management | Tool Maintenance | Furniture Making 3 | Furniture Making 4 | Furniture Repair | Cabinetmaking 3 | Cabinetmaking 4 | Production Planning | Production Management | Framing Systems 2 |
| | 3010 | 3020 | 30 | 040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 | 3190 | 3200 | 3210 |
| Basic set of hand tools (1) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Bench, equipment | | | | | | | | | | | | | | | | | | O | | |
| Bench, woodworking | | | | | | | | | | | | | | | | | | O | | |
| Biscuit joiner | | | | | | | | | | | | | O | | O | | | O | | |
| Cabinet, paint storage | | | | | | | | | | | | | | | | | | | | |
| Cleaner, vacuum | | | O | O | O | O | O | | O | | | O | ✓ | ✓ | ✓ | O | O | O | | |
| Compressor, air | | | O | O | O | O | | | | | | | O | O | O | O | O | O | | ✓ |
| Computer/printer | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
| Drill (variable, reversible) | O | | | O | | ✓ | | | O | | | O | ✓ | ✓ | ✓ | ✓ | ✓ | O | | |
| press (floor or bench) | | | | | | | | | | | | O | ✓ | ✓ | ✓ | | | O | | |
| set (imperial and metric) | | | | O | | ✓ | | | O | | | O | ✓ | ✓ | ✓ | ✓ | ✓ | O | | |
| impact | O | O | | | | | | | O | | | | | | | | O | | | |

(1) A basic set of hand tools might include awl, sliding T bev sanding block, wood chisels, assorted clamps, compass, wood files, marking gauge, hammer, putty and utility knife, level, mallet, nail set, planes, pliers, plumb bob, ruler, coping, crosscund rip saws, screwdrivers, squares and a tape measure.

* Refer to specific 1-credit courses listed in Sections D, E arF of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Building Systems (Processes and Applications)
B. Manufacturing Systems (Processes and Applications)

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | A | B | B | B | B | B | A | A | A | A | A | A | A | A | A | A | B | B | B | B | B | B | B | B | B |
| INSTRUCTIONAL QUALIFICATIONS | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * |  | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |  | * |
| CREDENTIALLING OPPORTUNITIES |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| EQUIPMENT | Basic Tools & Materials | Building Construction | Project Management | Solid Stock Construction | Turning Operations | Manufactured Materials | Mold Making & Casting | Site Preparation | Concrete Forming | Alternative Foundations | Framing Systems 1 | Roof Structures 1 | Exterior Finishing | Electrical Systems | Plumbing Systems | Climate Control Systems | Agri-structures | Multiple Materials | Furniture Making 1 | Furniture Making 2 | Finishing & Refinishing | Cabinetmaking 1 | Cabinetmaking 2 | Wood Forming | Manufacturing Systems | Product Development |
| | 1010 | 1070 | 1120 | 1130 | 1140 | 1160 | 1180 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 | 2180 | 2190 | 2200 |
| Fastener, explosive actuated |  |  |  |  |  |  |  |  | O |  |  |  |  |  |  |  | O |  |  |  |  |  |  |  |  |  |
| Former, vacuum |  |  |  |  |  |  | O |  |  |  |  |  |  |  |  |  |  | O |  |  |  |  |  |  |  | O |
| Grinder, tool | O | O | O | O | O | O | O |  |  |  |  |  |  |  |  |  | O | O | O | O |  | O | O |  |  | O |
| Gun, screw |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | O |  |  |  |  |  |  |  |  |  |
| Heater, strip |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | O |  |  |  |  |  |  |  | O |
| Jointer |  |  |  | O | O |  |  |  |  |  |  |  |  |  |  |  | O | O | O | O |  | O | O | O |  | O |
| Kiln |  |  |  |  |  |  | O |  |  |  |  |  |  |  |  |  |  | O |  |  |  |  |  |  |  | O |
| Lathe, wood |  |  |  | O | ✓ |  | O |  |  |  |  |  |  |  |  |  |  | O | O | O |  |  |  | O |  | O |
| Level, builders |  | O |  |  |  |  |  | O | O | O |  |  |  |  |  |  | O |  |  |  |  |  |  |  |  |  |
| Level, laser |  |  |  |  |  |  |  | O | O | O |  |  |  |  |  |  | O |  |  |  |  |  |  |  |  |  |
| Mixer, concrete |  |  |  |  |  |  | O |  | O | O |  |  | O |  |  |  | O | O |  |  |  |  |  |  |  | O |
| Molder, rotational |  |  |  |  |  |  | O |  |  |  |  |  |  |  |  |  |  | O |  |  |  |  |  |  |  | O |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Building Systems (Processes and Applications)
B. Manufacturing Systems (Processes and Applications)

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| | Concrete Work 3010 | Masonry Work 3020 | Wall & Ceiling Finishing 3030 | Stair Construction 3040 | Roof Structures 2 3050 | Doors & Trim 3060 | Floorcovering 3070 | Energy-efficient Housing 3080 | Renovations/Restorations 3090 | Commercial Structures 3100 | Site Management 3110 | Tool Maintenance 3120 | Furniture Making 3 3130 | Furniture Making 4 3140 | Furniture Repair 3150 | Cabinetmaking 3 3160 | Cabinetmaking 4 3170 | Production Planning 3190 | Production Management 3200 | Framing Systems 2 3210 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | A | A | A | A | A | A | A | A | A | B | B | B | B | B | B | B | B | A |
| INSTRUCTIONAL QUALIFICATIONS | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | | * | * | | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | * | | | | | | | | | | | | | | | | | | | |
| **EQUIPMENT** | | | | | | | | | | | | | | | | | | | | |
| Fastener, explosive actuated | O | O | | | | | | | O | | | | | | | | | | | O |
| Former, vacuum | O | | | | | | | | | | | | | | | | | O | | |
| Grinder, tool | | | | | | O | | | O | | | ✓ | ✓ | ✓ | ✓ | O | | O | | |
| Gun, screw | | | ✓ | | | | | | O | | | | | | | | | | | |
| Heater, strip | | | | | | | | | | | | | | | | | | O | | |
| Jointer | | | | | | O | | | | | | | ✓ | ✓ | ✓ | ✓ | O | O | | |
| Kiln | | | | | | | | | | | | | | | | | | O | | |
| Lathe, wood | | | | O | | | | | O | | | | O | O | O | | | O | | |
| Level, builders | ✓ | ✓ | | | | | | | O | | | | | | | | | | | |
| Level, laser | O | O | O | | | | | | O | | | | | | | | O | | | |
| Mixer, concrete | O | O | | | | | | | O | | | | | | | | | | | |
| Molder, rotational | | | | | | | | | | | | | | | | | | O | | |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Building Systems (Processes and Applications)
B. Manufacturing Systems (Processes and Applications)

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | A | B | B | B | B | B | A | A | A | A | A | A | A | A | A | A | B | B | B | B | B | B | B | B | B |
| INSTRUCTIONAL QUALIFICATIONS | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EQUIPMENT | Basic Tools & Materials | Building Construction | Project Management | Solid Stock Construction | Turning Operations | Manufactured Materials | Mold Making & Casting | Site Preparation | Concrete Forming | Alternative Foundations | Framing Systems 1 | Roof Structures 1 | Exterior Finishing | Electrical Systems | Plumbing Systems | Climate Control Systems | Agri-structures | Multiple Materials | Furniture Making 1 | Furniture Making 2 | Finishing & Refinishing | Cabinetmaking 1 | Cabinetmaking 2 | Wood Forming | Manufacturing Systems | Product Development |
| | 1010 | 1070 | 1120 | 1130 | 1140 | 1160 | 1180 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 | 2180 | 2190 | 2200 |
| Nailer, pneumatic | | | | | | O | | | | O | O | O | | | | | O | | O | O | | O | O | O | | O |
| Planer, thickness | | O | | O | O | | | | | | | | | | | | | O | O | O | | O | O | O | | O |
| Press, injection | O | | | | | | O | | | | | | | | | | | O | | | | | | | | O |
| Router (portable) | | | O | O | | O | O | | | | | | | | | | | O | O | O | | O | O | O | | O |
| Sander, belt (portable) | | | O | O | | O | O | | | | | | | | | | | O | O | O | O | O | O | O | | |
| combination belt and disc | | | | O | | O | O | | | | | | | | | | | O | O | O | | O | O | O | | O |
| finishing (portable) | | | O | O | | O | O | | | | | | | | | | | O | O | O | O | O | O | | | O |
| Saw, band | | O | O | O | O | O | O | | | | | | | | | | | O | O | O | | O | O | ✓ | | O |
| circular (portable) | | | | | | | | O | ✓ | ✓ | ✓ | ✓ | O | O | O | O | ✓ | | | | | | | | | ✓ |
| circular (table) | | O | | O | O | O | O | | | | | | | | | | O | O | ✓ | ✓ | | ✓ | ✓ | O | | O |
| power miter | | | O | O | | | | | | | | | O | | | | O | O | O | O | | O | O | O | | O |
| radial arm | | | | O | O | O | | | | O | O | O | | | | | O | O | O | O | | O | O | O | | O |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Building Systems (Processes and Applications)
B. Manufacturing Systems (Processes and Applications)

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | A | A | A | A | A | A | A | A | A | B | B | B | B | B | B | B | B | A |
| INSTRUCTIONAL QUALIFICATIONS | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | | * | * | | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | * | | | | | | | | | | | | | | | | | | | |
| EQUIPMENT | Concrete Work | Masonry Work | Wall & Ceiling Finishing | Stair Construction | Roof Structures 2 | Doors & Trim | Floorcovering | Energy-efficient Housing | Renovations/Restorations | Commercial Structures | Site Management | Tool Maintenance | Furniture Making 3 | Furniture Making 4 | Furniture Repair | Cabinetmaking 3 | Cabinetmaking 4 | Production Planning | Production Management | Framing Systems 2 |
| | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 | 3190 | 3200 | 3210 |
| Nailer, pneumatic | | | | O | O | O | O | | O | | | | O | O | O | | O | O | | O |
| Planer, thickness | | | | O | | O | | | O | | | | ✓ | ✓ | ✓ | O | O | O | | |
| Press, injection | | | | | | | | | | | | | | | | | | O | | |
| Router (portable) | | | | O | | O | | | O | | | | ✓ | ✓ | ✓ | O | O | O | | |
| Sander, belt (portable) | | | | O | | O | | | O | | | | ✓ | ✓ | ✓ | O | O | O | | |
| combination belt and disc | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | | O | | |
| finishing (portable) | | | | O | | O | | | O | | | | ✓ | ✓ | ✓ | O | O | O | | |
| Saw, band | | | | | | | | | | | | | ✓ | ✓ | ✓ | O | | O | | |
| circular (portable) | ✓ | O | | O | ✓ | | | | O | | | | | | | | | | | ✓ |
| circular (table) | O | | | O | | O | | | O | | | | ✓ | ✓ | ✓ | O | O | O | | |
| power miter | O | | O | O | | ✓ | | | O | | | | ✓ | ✓ | ✓ | O | ✓ | ✓ | | |
| radial arm | | | | O | O | | | | O | | | | O | O | O | O | | O | | O |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

**Course Parameters**

**_CONSTRUCTION TECHNOLOGIES_**

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Building Systems (Processes and Applications)
B. Manufacturing Systems (Processes and Applications)

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | A | B | B | B | B | B | A | A | A | A | A | A | A | A | A | A | B | B | B | B | B | B | B | B | B |
| INSTRUCTIONAL QUALIFICATIONS | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |  | * |
| CREDENTIALLING OPPORTUNITIES |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **EQUIPMENT** | Basic Tools & Materials | Building Construction | Project Management | Solid Stock Construction | Turning Operations | Manufactured Materials | Mold Making & Casting | Site Preparation | Concrete Forming | Alternative Foundations | Framing Systems 1 | Roof Structures 1 | Exterior Finishing | Electrical Systems | Plumbing Systems | Climate Control Systems | Agri-structures | Multiple Materials | Furniture Making 1 | Furniture Making 2 | Finishing & Refinishing | Cabinetmaking 1 | Cabinetmaking 2 | Wood Forming | Manufacturing Systems | Product Development |
|  | 1010 | 1070 | 1120 | 1130 | 1140 | 1160 | 1180 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 | 2180 | 2190 | 2200 |
| Saw, sabre (portable) |  |  |  | O |  | O |  |  |  |  | O | O | O | O | ✓ |  | O | O | O | O |  | O | O | O |  | O |
| scroll | O |  | O | O |  |  |  |  |  |  |  |  |  |  |  |  |  | O | O | O |  |  |  | O |  | O |
| Shaper |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | O | O | O |  | O | O | O |  | O |
| Table, glue |  |  |  | O |  | O | O |  |  |  |  |  |  |  |  |  |  | O | O | O |  | O | O | O |  | O |
| Trimmer, plastic laminate |  |  |  |  |  | O |  |  |  |  |  |  |  |  |  |  |  | O |  |  |  |  |  |  |  | O |
| Vises, woodworking | ✓ | ✓ | ✓ | ✓ |  | ✓ | ✓ |  |  |  |  |  |  |  |  |  |  | O | ✓ | ✓ |  | ✓ | ✓ | ✓ |  | O |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## CONSTRUCTION TECHNOLOGIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Building Systems (Processes and Applications)
B. Manufacturing Systems (Processes and Applications)

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | A | A | A | A | A | A | A | A | A | A | B | B | B | B | B | B | B | B | A |
| INSTRUCTIONAL QUALIFICATIONS | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * |  | * | * |  | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | * |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **EQUIPMENT** | Concrete Work | Masonry Work | Wall & Ceiling Finishing | Stair Construction | Roof Structures 2 | Doors & Trim | Floorcovering | Energy-efficient Housing | Renovations/Restorations | Commercial Structures | Site Management | Tool Maintenance | Furniture Making 3 | Furniture Making 4 | Furniture Repair | Cabinetmaking 3 | Cabinetmaking 4 | Production Planning | Production Management | Framing Systems 2 |
|  | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 | 3190 | 3200 | 3210 |
| Saw, sabre (portable) |  |  |  | ○ |  |  |  |  | ○ |  |  |  | ✓ | ✓ | ✓ | ✓ | ✓ | ○ |  | ✓ |
| scroll |  |  |  |  |  |  |  |  |  |  |  |  | ○ | ○ | ○ | ○ |  | ○ |  |  |
| Shaper |  |  |  |  |  | ○ |  |  | ○ |  |  |  | ○ | ○ | ○ | ○ |  | ○ |  |  |
| Table, glue |  |  |  |  |  |  |  |  |  |  |  |  | ○ | ○ | ○ | ○ |  | ○ |  |  |
| Trimmer, plastic laminate |  |  |  |  |  |  |  |  | ○ |  |  |  |  |  | ○ | ✓ | ✓ | ○ |  |  |
| Vises, woodworking |  |  |  |  |  |  |  |  |  |  |  |  | ✓ | ✓ | ✓ |  |  | ○ |  |  |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters for Cosmetology Studies

### Facilities

Selected courses in the Cosmetology Studies scope and sequence can be delivered in a typical classroom setting. Refer to Attachment 4: CTS without Labs in this appendix. Other courses require access to more specialized in-school or off-campus facilities. Facilities for courses in Cosmetology Studies, though variable by course, should provide student access to an environment:

- supporting personal grooming activities—Introductory level
- supporting the sale and provision of professional cosmetology-related services and products—Intermediate and Advanced levels.

Facilities supporting most courses should have:

- suitable work and seating areas
- adequate mirrors
- water and sinks (shampoo and utility)
- display and storage areas for equipment, tools and supplies
- whiteboards/bulletin boards
- fresh air and fume extraction
- lighting capabilities conducive to the use of haircolouring and makeup products
- waste disposal
- telephone service.

Courses that require access to facilities in addition to those present in a typical classroom setting are identified in the Course Parameters. For more information, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

### Equipment

A recommended equipment list is provided in the course parameters chart. Though not exhaustive, the list identifies equipment needed to facilitate the delivery of content and enable students to meet the course outcomes.

Equipment for courses in Cosmetology Studies can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers may find it desirable to develop and to keep current a list of additional materials and supplies required for specific learning activities planned within each course.

### Safety Considerations

The maintenance of a safe and sanitary learning/working environment is everyone's business in a facility supporting Cosmetology Studies instruction. Details relating to appropriate lighting, ventilation, personal cleanliness and customer service facilities should be addressed when designing a new facility. When operating a facility, suitable equipment and supplies must be available to handle dirty laundry, clean laundry, storage of supplies and the sterilization of tools and implements.

Each Cosmetology Studies course contains learner outcomes relating to safety and sanitation. Students can acquire additional competencies relating to safety by enrolling in the following courses.

- CTR1210: Personal Safety Management
- CTR2210: Workplace Safety Practices

**Instructional Qualifications**

Courses in Cosmetology Studies can be implemented by Alberta Certified Teachers who have interest in providing instruction in school and off-campus learning environments. A background and a journeyman credential in hairstyling and esthetology are assets to those providing direct instruction in Cosmetology Studies courses, particularly at the intermediate and advanced level. Teachers may find it desirable to access sources of instructional support available from the hair and beauty industry, professional associations and consultants, and relevant government agencies, such as the Apprenticeship and Industry Training Division, Alberta Advanced Education and Career Development.

To ensure compliance with legislated safety and occupation standards, most courses in Cosmetology Studies require that instruction be provided by a person(s) holding a Journeyman Hairstylist credential. Courses requiring additional instructor credentials are identified in the Course Parameters chart. For more information regarding each instructor credential, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

**Credentialling Opportunities**

Students may earn credentials recognized by business, industry and post-secondary institutions by demonstrating a specific set of competencies. Based on an articulation agreement established with the Apprenticeship and Industry Training Division, Alberta Advanced Education and Career Development, students who complete specified CTS courses may be eligible to obtain advanced standing in the apprenticeship program for Hairstylist. Further details regarding each articulation agreement, including a correlation to CTS strands and courses, are provided in Appendix 5: Planning Ahead—CTS Transitions into Post-secondary Programs and the Workplace. Additional information can be obtained by contacting the Apprenticeship and Industry Training Division, Alberta Advanced Education and Career Development. A list of local Career Development Centres throughout Alberta is also provided in Appendix 5: Planning Ahead—CTS Transitions into Post-secondary Programs and the Workplace.

## Course Parameters

## COSMETOLOGY STUDIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Images and Practices
B. Hair and Scalp Care
C. Haircutting
D. Chemical Services: Permanent Waving
E. Chemical Services: Haircolouring
F. Skin Care
G. Male Facial Grooming
H. Nail Care
I. Special Effects/Services
J. Enterprise and Competition

EQUIPMENT
✓ Recommended in order to meet course outcomes

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | B | B | B | D | F | H | I | B | B | B | C | C | D | D | D | E | E | E | F | F | F | H | H | H | I | I | J | J |
| INSTRUCTIONAL QUALIFICATIONS | | | * | * | | | | | | * | * | * | * | * | * | * | * | * | * | | | | | | | | | * | |
| INSTRUCTIONAL FACILITIES | | | * | * | | * | | | | * | * | * | * | * | * | * | * | * | * | * | * | * | | | * | | | * | |
| CREDENTIALLING OPPORTUNITIES | * | * | * | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | * | * | | | * |
| EQUIPMENT | Personal Images | Hair Graphics 1 | Hair & Scalp Care 1 | Forming & Finishing 1 | Permanent Waving 1 | Skin Care 1 | Manicuring 1 | Theatrical Makeup 1 | Hair Graphics 2 | Hair & Scalp Care 2 | Forming & Finishing 2 | Haircutting 1 | Hair Care & Cutting 1 | Permanent Waving 2 | Permanent Waving 3 | Permanent Waving 4 | Colouring 1 | Colour Removal 1 | Colouring & Removal 1 | Facials & Makeup 1 | Facials & Makeup 2 | Skin Care 2 | Manicuring 2 | Nail Art | Manicuring 3 | Hairpieces & Extensions | Theatrical Makeup 2 | Historical Cosmetology | Sales & Service 1 |
| | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 1070 | 1080 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 | 2180 | 2190 | 2200 | 2210 |
| Brushes, assorted | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | ✓ | ✓ | ✓ | |
| Canvas blocks and pins | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | |
| Cash register | | | | | | | | | | | | | ✓ | | | ✓ | | | | | ✓ | ✓ | | | ✓ | | | | |
| Chairs, shampoo | ✓ | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| styling, hydraulic | ✓ | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| barber | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| facial, adjustable | | | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | | | | | | | |
| waiting | | | | | | | | | | | | | ✓ | | | ✓ | | | ✓ | | ✓ | ✓ | | | ✓ | | | | |
| Clippers, electric (assorted) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Combs, assorted | ✓ | | ✓ | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | ✓ | ✓ | ✓ | |
| Colour accelerator | | | | | | | | | | | | | | | | | | ✓ | ✓ | | | | | | | | | | |

**Note**: Most courses require access to student work areas (tables/desks), utility and shampoo sinks, teacher desk, filing cabinets, magazine/book racks, washing machine, clothes dryer, sanitizers/sterilizers (ultraviolet and glass), white towels, utility trolleys, capes/gowns, and graduated plastic applicators.

*** Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.**

## Course Parameters

**COSMETOLOGY STUDIES**

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Images and Practices
B. Hair and Scalp Care
C. Haircutting
D. Chemical Services: Permanent Waving
E. Chemical Services: Haircolouring
F. Skin Care
G. Male Facial Grooming
H. Nail Care
I. Special Effects/Services
J. Enterprise and Competition

EQUIPMENT
✓ Recommended in order to meet course outcomes

| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | B | B | B | C | C | C | D | D | D | E | E | E | F | F | F | G | G | H | H | H | I | I | I | I | I | J | J | J |
| INSTRUCTIONAL QUALIFICATIONS |  |  | * | * | * | * | * | * | * | * | * | * | * |  |  | * | * | * |  |  |  |  |  |  |  |  | * |  | * |
| INSTRUCTIONAL FACILITIES |  | * | * | * | * | * | * | * | * | * | * | * | * | * |  | * | * | * | * | * | * | * | * | * | * | * | * |  | * |
| CREDENTIALLING OPPORTUNITIES | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |  | * | * |  |  | * | * |  |  |
| EQUIPMENT | Professional Practices | Long Hair Graphics | Hair & Scalp Care 3 | Hair & Scalp Care 4 | Haircutting 2 | Haircutting 3 | Hair Care & Cutting 2 | Permanent Waving 5 | Relax/Straighten Hair | Wave, Relax & Straighten Hair | Colouring 2 | Colour Removal 2 | Colouring & Removal 2 | Body Therapy | Hair Removal | Skin Care 3 | Male Facial Grooming 1 | Male Facial Grooming 2 | Nail Technology | Pedicuring | Nail Care | Wigs & Toupees | Hair Goods | Theatrical Makeup 3 | Theatrical Makeup 4 | Facial & Body Adornment | Creative Cosmetology | Sales & Services 2 | Competition Cosmetology |
|  | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 | 3180 | 3190 | 3200 | 3210 | 3220 | 3230 | 3240 | 3250 | 3260 | 3270 | 3280 | 3290 |
| Brushes, assorted | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  |  |  |  |  |  | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Canvas blocks and pins |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ | ✓ |  |  |  |  |  |  |
| Cash register | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Chairs, shampoo | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| styling, hydraulic | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| barber |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ | ✓ |  |  |  |  |  |  |  |  |  |  |  |
| facial, adjustable |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ | ✓ | ✓ | ✓ | ✓ |  |  |  |  |  |  |  |  |  |  |  |
| waiting | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Clippers, electric (assorted) |  |  |  |  | ✓ | ✓ | ✓ |  |  |  |  |  |  |  | ✓ |  | ✓ | ✓ |  |  |  |  |  |  |  |  | ✓ |  | ✓ |
| Combs, assorted |  | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  |  |  |  |  |  |  |  | ✓ | ✓ | ✓ |  |  |  | ✓ | ✓ |
| Colour accelerator |  |  |  |  |  |  |  |  |  |  | ✓ | ✓ | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Note** Most courses require access to student work areas (tables/desks), utility and shampoo sinks, teacher desk, filing cabinets, magazine/book racks, washing machin clothes dryer, sanitizers/sterilizers (ultraviolet and glass), white towels, utility trolleys, capes/gowns, and graduated plastic applicators.

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## COSMETOLOGY STUDIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Images and Practices
B. Hair and Scalp Care
C. Haircutting
D. Chemical Services: Permanent Waving
E. Chemical Services: Haircolouring
F. Skin Care
G. Male Facial Grooming
H. Nail Care
I. Special Effects/Services
J. Enterprise and Competition

EQUIPMENT
✓ Recommended in order to meet course outcomes

| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | B | B | B | D | F | H | I | B | B | B | C | C | D | D | D | E | E | E | F | F | F | H | H | H | I | I | J | J |
| INSTRUCTIONAL QUALIFICATIONS | | | * | * | | | | | | * | * | * | * | * | * | * | * | * | * | | | | | | | | | * | |
| INSTRUCTIONAL FACILITIES | | | * | * | | * | | | | * | * | * | * | * | * | * | * | * | * | * | * | * | | | * | | | * | |
| CREDENTIALLING OPPORTUNITIES | * | * | * | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | * | * | | | * |
| EQUIPMENT | Personal Images | Hair Graphics 1 | Hair & Scalp Care 1 | Forming & Finishing 1 | Permanent Waving 1 | Skin Care 1 | Manicuring 1 | Theatrical Makeup 1 | Hair Graphics 2 | Hair & Scalp Care 2 | Forming & Finishing 2 | Haircutting 1 | Hair Care & Cutting 1 | Permanent Waving 2 | Permanent Waving 3 | Permanent Waving 4 | Colouring 1 | Colour Removal 1 | Colouring & Removal 1 | Facials & Makeup 1 | Facials & Makeup 2 | Skin Care 2 | Manicuring 2 | Nail Art | Manicuring 3 | Hairpieces & Extensions | Theatrical Makeup 2 | Historical Cosmetology | Sales & Service 1 |
| | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 1070 | 1080 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 | 2180 | 2190 | 2200 | 2210 |
| Curling irons, assorted | ✓ | | | ✓ | | | | | | | ✓ | | ✓ | | | | | | | | | | | | | ✓ | | ✓ | |
| Dresserettes/vanities with mirrors | ✓ | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Esthetology technology | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| magnifier | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | | | | | | | |
| tweezers, assorted | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| esthetological treatment units, e.g., high frequency | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| False eyelashes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hair blowers | ✓ | | | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | ✓ | ✓ | |
| Hair clips | ✓ | | | ✓ | | | | | | | ✓ | | ✓ | | | | | | | | | | | | | ✓ | | ✓ | |
| Hair crimpers, electric | ✓ | | | ✓ | | | | | | | ✓ | | ✓ | | | | | | | | | | | | | ✓ | | ✓ | |

**Note** Most courses require access to student work areas (tables/desks), utility and shampoo sinks, teacher desk, filing cabinets, magazine/book racks, washing machine, clothes dryer, sanitizers/sterilizers (ultraviolet and glass), white towels, utility trolleys, capes/gowns, and graduated plastic applicators.

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## Course Parameters

## COSMETOLOGY STUDIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Images and Practices
B. Hair and Scalp Care
C. Haircutting
D. Chemical Services: Permanent Waving
E. Chemical Services: Haircolouring
F. Skin Care
G. Male Facial Grooming
H. Nail Care
I. Special Effects/Services
J. Enterprise and Competition

EQUIPMENT
✓ Recommended in order to meet course outcomes

| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | B | B | B | C | C | C | D | D | D | E | E | E | F | F | F | G | G | H | H | H | I | I | I | I | I | J | J | J |
| INSTRUCTIONAL QUALIFICATIONS | | | * | * | * | * | * | * | * | * | * | * | * | | | * | * | * | | | | | | | | | * | | * |
| INSTRUCTIONAL FACILITIES | | * | * | * | * | * | * | * | * | | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | | * |
| CREDENTIALLING OPPORTUNITIES | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | * | * | | | * | * | | |
| **EQUIPMENT** | Professional Practices | Long Hair Graphics | Hair & Scalp Care 3 | Hair & Scalp Care 4 | Haircutting 2 | Haircutting 3 | Hair Care & Cutting 2 | Permanent Waving 5 | Relax/Straighten Hair | Wave, Relax & Straighten Hair | Colouring 2 | Colour Removal 2 | Colouring & Removal 2 | Body Therapy | Hair Removal | Skin Care 3 | Male Facial Grooming 1 | Male Facial Grooming 2 | Nail Technology | Pedicuring | Nail Care | Wigs & Toupees | Hair Goods | Theatrical Makeup 3 | Theatrical Makeup 4 | Facial & Body Adornment | Creative Cosmetology | Sales & Services 2 | Competition Cosmetology |
| | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 | 3180 | 3190 | 3200 | 3210 | 3220 | 3230 | 3240 | 3250 | 3260 | 3270 | 3280 | 3290 |
| Curling irons, assorted | | | | | | | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | | | | ✓ | | ✓ |
| Dresserettes/vanities with mirrors | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Esthetology technology | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| magnifier | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| tweezers, assorted | | | | | | | ✓ | | | | | | | | | | | | | | | | | | | | | | |
| esthetological treatment units; e.g., high frequency | | | | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | |
| False eyelashes | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | | ✓ |
| Hair blowers | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | |
| Hair clips | | | ✓ | ✓ | | | ✓ | | | | | | | | | | | | | | | | | | | | | ✓ | |
| Hair crimpers, electric | | | | | | | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | | | | ✓ | | ✓ |

**Note**: Most courses require access to student work areas (tables/desks), utility and shampoo sinks, teacher desk, filing cabinets, magazine/book racks, washing machine, clothes dryer, sanitizers/sterilizers (ultraviolet and glass), white towels, utility trolleys, capes/gowns, and graduated plastic applicators.

*** Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.**

## Course Parameters

## COSMETOLOGY STUDIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Images and Practices
B. Hair and Scalp Care
C. Haircutting
D. Chemical Services: Permanent Waving
E. Chemical Services: Haircolouring
F. Skin Care
G. Male Facial Grooming
H. Nail Care
I. Special Effects/Services
J. Enterprise and Competition

EQUIPMENT
✓ Recommended in order to meet course outcomes

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | B | B | B | D | F | H | I | B | B | B | C | C | D | D | D | E | E | E | F | F | F | H | H | H | I | I | J | J |
| INSTRUCTIONAL QUALIFICATIONS | | | * | * | | | | | | * | * | * | * | * | * | * | * | * | * | | | | | | | | | * | |
| INSTRUCTIONAL FACILITIES | | | * | * | | * | | | | * | * | * | * | * | * | * | * | * | * | * | * | * | | | * | | | * | |
| CREDENTIALLING OPPORTUNITIES | * | * | * | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | * | * | | | * |
| **EQUIPMENT** | Personal Images | Hair Graphics 1 | Hair & Scalp Care 1 | Forming & Finishing 1 | Permanent Waving 1 | Skin Care 1 | Manicuring 1 | Theatrical Makeup 1 | Hair Graphics 2 | Hair & Scalp Care 2 | Forming & Finishing 2 | Haircutting 1 | Hair Care & Cutting 1 | Permanent Waving 2 | Permanent Waving 3 | Permanent Waving 4 | Colouring 1 | Colour Removal 1 | Colouring & Removal 1 | Facials & Makeup 1 | Facials & Makeup 2 | Skin Care 2 | Manicuring 2 | Nail Art | Manicuring 3 | Hairpieces & Extensions | Theatrical Makeup 2 | Historical Cosmetology | Sales & Service 1 |
| | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 1070 | 1080 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 | 2180 | 2190 | 2200 | 2210 |
| Hair dryers/lamp dryers | ✓ | | | ✓ | | | | | | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ | ✓ | | | | | | | ✓ | | ✓ | |
| pieces, assorted | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | |
| straightener, electric | | | | | | | | | | | ✓ | | ✓ | | | | | | | | | | | | | ✓ | | ✓ | |
| testing technology | | | | | | | | | | ✓ | ✓ | | ✓ | | | | | | | | | | | | | | | | |
| Hand style mirrors | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hot combs | | | | | | | | | | | ✓ | | ✓ | | | | | | | | | | | | | ✓ | | ✓ | |
| Manicure kit, electric | | | | | | | | | | | | | | | | | | | | | | | ✓ | | ✓ | | | | |
| finger bowls/baths | ✓ | | | | | | ✓ | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | | | | |
| cuticle scissors | ✓ | | | | | | ✓ | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | | | | |
| cuticle clippers | ✓ | | | | | | ✓ | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | | | | |
| nail files | ✓ | | | | | | ✓ | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | | | | |

**Note**: Most courses require access to student work areas (tables/desks), utility and shampoo sinks, teacher desk, filing cabinets, magazine/book racks, washing machine, clothes dryer, sanitizers/sterilizers (ultraviolet and glass), white towels, utility trolleys, capes/gowns, and graduated plastic applicators.

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Images and Practices
B. Hair and Scalp Care
C. Haircutting
D. Chemical Services: Permanent Waving
E. Chemical Services: Haircolouring
F. Skin Care
G. Male Facial Grooming
H. Nail Care
I. Special Effects/Services
J. Enterprise and Competition

EQUIPMENT
✓ Recommended in order to meet course outcomes

| | Professional Practices | Long Hair Graphics | Hair & Scalp Care 3 | Hair & Scalp Care 4 | Haircutting 2 | Haircutting 3 | Hair Care & Cutting 2 | Permanent Waving 5 | Relax/Straighten Hair | Wave, Relax & Straighten Hair | Colouring 2 | Colour Removal 2 | Colouring & Removal 2 | Body Therapy | Hair Removal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | B | B | B | C | C | C | D | D | D | E | E | E | F | F |
| INSTRUCTIONAL QUALIFICATIONS | | | * | * | * | * | * | * | * | * | * | * | * | | |
| INSTRUCTIONAL FACILITIES | | * | * | * | * | * | * | * | * | | * | * | * | * | |
| CREDENTIALLING OPPORTUNITIES | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| EQUIPMENT | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 | 3150 |
| Hair dryers/lamp dryers | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| pieces, assorted | | | | | | | | | | | | | | | |
| straightener, electric | | | | | | | ✓ | | | ✓ | | | | | |
| testing technology | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| Hand style mirrors | | | | | | | | | | | | | | | |
| Hot combs | | | | | | | ✓ | | | ✓ | | | | | |
| Manicure kit, electric | | | | | | | | | | | | | | | |
| finger bowls/baths | | | | | | | | | | | | | | | |
| cuticle scissors | | | | | | | | | | | | | | | |
| cuticle clippers | | | | | | | | | | | | | | | |
| nail files | | | | | | | | | | | | | | | |

| | Skin Care 3 | Male Facial Grooming 1 | Male Facial Grooming 2 | Nail Technology | Pedicuring | Nail Care | Wigs & Toupees | Hair Goods | Theatrical Makeup 3 | Theatrical Makeup 4 | Facial & Body Adornment | Creative Cosmetology | Sales & Services 2 | Competition Cosmetology |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | F | G | G | H | H | H | I | I | I | I | I | J | J | J |
| INSTRUCTIONAL QUALIFICATIONS | * | * | * | | | | | | | | | * | | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | * | * | * | * | * | | * |
| CREDENTIALLING OPPORTUNITIES | * | * | * | * | * | | * | * | | | * | * | | |
| EQUIPMENT | 3160 | 3170 | 3180 | 3190 | 3200 | 3210 | 3220 | 3230 | 3240 | 3250 | 3260 | 3270 | 3280 | 3290 |
| Hair dryers/lamp dryers | | | | | | | ✓ | ✓ | | | | | | ✓ |
| pieces, assorted | | | | | | | ✓ | ✓ | | | | | | |
| straightener, electric | | | | | | | ✓ | ✓ | | | | ✓ | | |
| testing technology | | | | | | | | | | | | | | |
| Hand style mirrors | | | | | | | | | | | | | | |
| Hot combs | | | | | | | ✓ | ✓ | | | | ✓ | | |
| Manicure kit, electric | | | | | ✓ | ✓ | | | | | | | | |
| finger bowls/baths | | | | ✓ | ✓ | ✓ | | | | | | | | |
| cuticle scissors | | | | ✓ | ✓ | ✓ | | | | | | | | |
| cuticle clippers | | | | ✓ | ✓ | ✓ | | | | | | | | |
| nail files | | | | ✓ | ✓ | ✓ | | | | | | | | |

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## Course Parameters

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Images and Practices
B. Hair and Scalp Care
C. Haircutting
D. Chemical Services: Permanent Waving
E. Chemical Services: Haircolouring
F. Skin Care
G. Male Facial Grooming
H. Nail Care
I. Special Effects/Services
J. Enterprise and Competition

EQUIPMENT
✓ Recommended in order to meet course outcomes

| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | B | B | B | D | F | H | I | B | B | B | C | C | D | D | D | E | E | E | F | F | F | H | H | H | I | I | J | J |
| INSTRUCTIONAL QUALIFICATIONS | | | * | * | | | | | | * | * | * | * | * | * | * | * | * | * | | | | | | | | | * | |
| INSTRUCTIONAL FACILITIES | | | * | * | | * | | | | * | * | * | * | * | * | * | * | * | * | * | * | * | | | * | | | * | |
| CREDENTIALLING OPPORTUNITIES | * | * | * | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | * | * | | | * |
| | Personal Images | Hair Graphics 1 | Hair & Scalp Care 1 | Forming & Finishing 1 | Permanent Waving 1 | Skin Care 1 | Manicuring 1 | Theatrical Makeup 1 | Hair Graphics 2 | Hair & Scalp Care 2 | Forming & Finishing 2 | Haircutting 1 | Hair Care & Cutting 1 | Permanent Waving 2 | Permanent Waving 3 | Permanent Waving 4 | Colouring 1 | Colour Removal 1 | Colouring & Removal 1 | Facials & Makeup 1 | Facials & Makeup 2 | Skin Care 2 | Manicuring 2 | Nail Art | Manicuring 3 | Hairpieces & Extensions | Theatrical Makeup 2 | Historical Cosmetology | Sales & Service 1 |
| **EQUIPMENT** | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 1070 | 1080 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 | 2180 | 2190 | 2200 | 2210 |
| Manicure kit, electric | | | | | | | | | | | | | | | | | | | | | | | ✓ | | ✓ | | | | |
| nail repair/extension kits | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| footbaths | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mannequins and stands | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ |
| Neck dusters | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Perm waving equipment | | | | | ✓ | | | | | | | | | ✓ | | ✓ | | | | | | | | | | | | | |
| perm rods, croquignole | | | | | ✓ | | | | | | | | | ✓ | | ✓ | | | | | | | | | | | | | |
| perm rods, spiral | | | | | | | | | | | | | | ✓ | | ✓ | | | | | | | | | | | | | |
| perm designer rods | | | | | | | | | | | | | | ✓ | | ✓ | | | | | | | | | | | | | |
| perm rod containers | | | | | ✓ | | | | | | | | | ✓ | | ✓ | | | | | | | | | | | | | |
| Perm wave technology | | | | | | | | | | | | | | ✓ | ✓ | ✓ | | | | | | | | | | | | | |

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## Course Parameters

LEVEL
1 – Introductory
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THEME
A. Images and Practices
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G. Male Facial Grooming
H. Nail Care
I. Special Effects/Services
J. Enterprise and Competition

EQUIPMENT
✓ Recommended in order to meet course outcomes

| | Professional Practices | Long Hair Graphics | Hair & Scalp Care 3 | Hair & Scalp Care 4 | Haircutting 2 | Haircutting 3 | Hair Care & Cutting 2 | Permanent Waving 5 | Relax/Straighten Hair | Wave, Relax & Straighten Hair | Colouring 2 | Colour Removal 2 | Colouring & Removal 2 | Body Therapy | Hair Removal | Skin Care 3 | Male Facial Grooming 1 | Male Facial Grooming 2 | Nail Technology | Pedicuring | Nail Care | Wigs & Toupees | Hair Goods | Theatrical Makeup 3 | Theatrical Makeup 4 | Facial & Body Adornment | Creative Cosmetology | Sales & Services 2 | Competition Cosmetology |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | B | B | B | C | C | C | D | D | D | E | E | E | F | F | F | G | G | H | H | H | I | I | I | I | I | J | J | J |
| INSTRUCTIONAL QUALIFICATIONS | | | * | * | * | * | * | * | * | * | * | * | * | | | * | * | * | | | | | | | | | * | | * |
| INSTRUCTIONAL FACILITIES | | * | * | * | * | * | * | * | * | * | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | | * |
| CREDENTIALLING OPPORTUNITIES | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | * | * | | | * | * | | |
| EQUIPMENT | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 | 3180 | 3190 | 3200 | 3210 | 3220 | 3230 | 3240 | 3250 | 3260 | 3270 | 3280 | 3290 |
| Manicure kit, electric | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | | | | | | | | |
| nail repair/extension kits | | | | | | | | | | | | | | | | | | | ✓ | | ✓ | | | | | | | | |
| footbaths | | | | | | | | | | | | | | | | | | | ✓ | | ✓ | | | | | | | | |
| Mannequins and stands | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Neck dusters | | | | | ✓ | ✓ | ✓ | | | | | | | | ✓ | ✓ | ✓ | ✓ | | | | | | | | | ✓ | | ✓ |
| Perm waving equipment | | | | | | | | | ✓ | ✓ | | | | | | | | | | | | | | | | | | | |
| perm rods, croquignole | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| perm rods, spiral | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| perm designer rods | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| perm rod containers | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Perm wave technology | | | | | | | | | | ✓ | | | | | | | | | | | | | | | | | | | |

**Note**: Most courses require access to student work areas (tables/desks), utility and shampoo sinks, teacher desk, filing cabinets, magazine/book racks, washing machine, clothes dryer, sanitizers/sterilizers (ultraviolet and glass), white towels, utility trolleys, capes/gowns, and graduated plastic applicators.

*** Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.**

## COSMETOLOGY STUDIES

### Course Parameters

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Images and Practices
B. Hair and Scalp Care
C. Haircutting
D. Chemical Services: Permanent Waving
E. Chemical Services: Haircolouring
F. Skin Care
G. Male Facial Grooming
H. Nail Care
I. Special Effects/Services
J. Enterprise and Competition

EQUIPMENT
✓ Recommended in order to meet course outcomes

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | B | B | B | D | F | H | I | B | B | B | C | C | D | D | D | E | E | E | F | F | F | H | H | H | I | I | J | J |
| INSTRUCTIONAL QUALIFICATIONS | | | * | * | | | | | | * | * | * | * | * | * | * | * | * | * | | | | | | | | | * | |
| INSTRUCTIONAL FACILITIES | | | * | * | | * | | | | * | * | * | * | * | * | * | * | * | * | * | * | * | | | * | | | * | |
| CREDENTIALLING OPPORTUNITIES | * | * | * | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | * | * | | | * |
| **EQUIPMENT** | Personal Images | Hair Graphics 1 | Hair & Scalp Care 1 | Forming & Finishing 1 | Permanent Waving 1 | Skin Care 1 | Manicuring 1 | Theatrical Makeup 1 | Hair Graphics 2 | Hair & Scalp Care 2 | Forming & Finishing 2 | Haircutting 1 | Hair Care & Cutting 1 | Permanent Waving 2 | Permanent Waving 3 | Permanent Waving 4 | Colouring 1 | Colour Removal 1 | Colouring & Removal 1 | Facials & Makeup 1 | Facials & Makeup 2 | Skin Care 2 | Manicuring 2 | Nail Art | Manicuring 3 | Hairpieces & Extensions | Theatrical Makeup 2 | Historical Cosmetology | Sales & Service 1 |
| | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 1070 | 1080 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 | 2180 | 2190 | 2200 | 2210 |
| Polystyrene blocks and pins | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | |
| Razors, assorted | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Reception desk | | | | | | | | | | | | | ✓ | | | ✓ | | | ✓ | | ✓ | ✓ | | | ✓ | | | | |
| Rollers, assorted | ✓ | | | ✓ | | | | | | | ✓ | | ✓ | | | | | | | | | | | | | ✓ | | ✓ | |
| Shears, assorted | | | | | | | | | | | | ✓ | ✓ | | | | | | | | | | | | | | | | |
| Steamer, scalp | | | | | | | | | | ✓ | | | ✓ | | | | | | | | | | | | | | | | |
| facial | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tent style folding mirrors | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Towels, coloured | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | |
| Vibromassager, electric | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | | | | | | | |
| Wax heaters/applicators | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Wigs, assorted | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | |

**Note**: Most courses require access to student work areas (tables/desks), utility and shampoo sinks, teacher desk, filing cabinets, magazine/book racks, washing machine, clothes dryer, sanitizers/sterilizers (ultraviolet and glass), white towels, utility trolleys, capes/gowns, and graduated plastic applicators.

*** Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.**

## Course Parameters

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Images and Practices
B. Hair and Scalp Care
C. Haircutting
D. Chemical Services: Permanent Waving
E. Chemical Services: Haircolouring
F. Skin Care
G. Male Facial Grooming
H. Nail Care
I. Special Effects/Services
J. Enterprise and Competition

EQUIPMENT
✓ Recommended in order to meet course outcomes

| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | B | B | B | C | C | C | D | D | D | E | E | E | F | F | F | G | G | H | H | H | I | I | I | I | I | J | J | J |
| INSTRUCTIONAL QUALIFICATIONS | | | * | * | * | * | * | * | * | * | * | * | * | | | * | * | * | | | | | | | | | * | | * |
| INSTRUCTIONAL FACILITIES | | * | * | * | * | * | * | * | * | | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | | * |
| CREDENTIALLING OPPORTUNITIES | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | * | * | | | * | * | | |
| **EQUIPMENT** | Professional Practices | Long Hair Graphics | Hair & Scalp Care 3 | Hair & Scalp Care 4 | Haircutting 2 | Haircutting 3 | Hair Care & Cutting 2 | Permanent Waving 5 | Relax/Straighten Hair | Wave, Relax & Straighten Ha | Colouring 2 | Colour Removal 2 | Colouring & Removal 2 | Body Therapy | Hair Removal | Skin Care 3 | Male Facial Grooming 1 | Male Facial Grooming 2 | Nail Technology | Pedicuring | Nail Care | Wigs & Toupees | Hair Goods | Theatrical Makeup 3 | Theatrical Makeup 4 | Facial & Body Adornment | Creative Cosmetology | Sales & Services 2 | Competition Cosmetology |
| | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 | 3180 | 3190 | 3200 | 3210 | 3220 | 3230 | 3240 | 3250 | 3260 | 3270 | 3280 | 3290 |
| Polystyrene blocks and pins | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | | | | | | |
| Razors, assorted | | | | | ✓ | ✓ | ✓ | | | | | | | | | | ✓ | ✓ | | | | | | | | | | | |
| Reception desk | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Rollers, assorted | | | ✓ | ✓ | | | ✓ | | | | | | | | | | | | | | | | | | | | | ✓ | |
| Shears, assorted | | | | | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | |
| Steamer, scalp | | | ✓ | ✓ | | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | |
| facial | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| Tent-style folding mirrors | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Towels, coloured | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vibromassager, electric | | | | | | | | | | | | | | ✓ | ✓ | ✓ | | | | | | | | | | | | | |
| Wax heaters/applicators | | | | | | | ✓ | | | | | | | ✓ | | | | | | | | | | | | | | | |
| Wigs, assorted | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | | | | | | |

**Note** Most courses require access to student work areas (tables/desks), utility and shampoo sinks, teacher desk, filing cabinets, magazine/book racks, washing machine, clothes dryer, sanitizers/sterilizers (ultraviolet and glass), white towels, utility trolleys, capes/gowns, and graduated plastic applicators.

*** Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.**

## Course Parameters for Design Studies

### Facilities

Some courses in the Design Studies scope and sequence can be delivered in a typical classroom setting. Refer to Attachment 4: CTS without Labs in this appendix. Others require access to more specialized in-school and off-campus facilities, such as:

- science, design, construction, fabrication and mechanics laboratories
- observation and training sites sponsored by relevant industry, government and/or post-secondary agencies
- resource centres equipped with computer hardware/software and audio-visual material.

Also desirable, though not essential, are instructional facilities that have:

- water and sinks
- whiteboards/bulletin boards
- fresh air and fume extraction
- an exterior exit
- telephone/data line service.

The type of facility and equipment required for the Design Studies strand is determined by the nature and scope of the program offered. Programs emphasizing the drafting component of the strand require computers with CAD—Computer Assisted Design—software and associated printers/plotters and/or drafting tables with drafting machines. The two-dimensional design courses can be taught using drafting or art tables with a set of design materials and/or using computers with graphic design software. Three-dimensional design at the intermediate and advanced levels requires specialized hand and power tools appropriate for the materials being used in designing. The facility might require specialized power outlets, dust and fume extraction and access to water. Given these parameters, a reasonable Design Studies program could be provided in existing Industrial Arts multiple activity lab, Fine Arts lab or drafting facility.

Courses that require access to facilities in addition to those present in a typical classroom setting are identified in the Course Parameters. For more information, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

### Equipment

A recommended equipment list is provided in the course parameters chart. Though not exhaustive, the list identifies equipment recommended as necessary to meet the course outcomes.

Teachers may find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each course.

### Safety and Security Considerations

Safety and security issues in Design Studies depend on the scope of the program provided. Safety with respect to the use of equipment, materials and supplies is important in two-dimensional design and three-dimensional design; e.g., machines and tools for cutting, model making. Ergonomic considerations should also be addressed where students work at computers and tables. Security should include power lockouts where power equipment such as a band saw is used in the program. Appropriate security measures should also be adopted for tracking equipment and supplies.

### Instructional Qualifications

Courses in Design Studies can be implemented by Alberta Certified Teachers who have interest in providing instruction in classroom, laboratory and/or outdoor environments. A background in art, science, visual communication and/or relevant industry is an asset to those who provide instruction in Design Studies courses, particularly at the intermediate and advanced levels. Teachers may find it desirable to access sources of instructional support available from industry, professional associations and consultants, and relevant government agencies.

Designers are professional creators who solve practical problems through their creations. Teachers of Art, Commercial Art, Industrial Arts, Drafting, and Clothing and Textiles may find a transition into Design Studies relatively easy, as they have had some experience with the content, and perhaps the conceptual framework. Due to the scope of the program, additional training through university, college or technical schools would be beneficial. Formal design training is an advantage.

**Credentialling Opportunities**

There is no formal articulation to an apprenticeable trade; however, some aspects of Design Studies would support the Graphic Arts Craftsman–Prepress Certification. While the emphasis on problem solving in Design Studies makes it valuable for all trades, occupations and professions, there are no credentialling opportunities identified at this time.

## Course Parameters

## DESIGN STUDIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Design Skills, Processes and Applications
B. Drafting for Design and Technical Drawing Skills
C. Business/Issues/History

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | A | A | B | B | A | A | B | B | B | C | A | A | A | A | A | A | A | A | A | B | B | B | B | B | B | B | C | C | C |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **EQUIPMENT** | Sketch, Draw & Model | The Design Process | 2-D Design Fundamentals | 3-D Design Fundamentals | CAD Fundamentals | Drafting/Design Fundamentals | 2-D Design Applications | 3-D Design Applications | CAD Applications | Drafting/Design Applications | Technical Drawing Applications | The Evolution of Design | 2-D Design Studio 1 | 2-D Design Studio 2 | 2-D Design Studio 3 | 3-D Design Studio 1 | 3-D Design Studio 2 | 3-D Design Studio 3 | Living Environment Studio 1 | Living Environment Studio 2 | Living Environment Studio 3 | CAD Modelling Studio | Drafting/Design Studio 1 | Drafting/Design Studio 2 | Drafting/Design Studio 3 | Technical Drawing Studio 1 | Technical Drawing Studio 2 | Technical Drawing Studio 3 | Visualizing the Future | The Design Profession | Portfolio Presentation |
| | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 | 3180 | 3190 |
| Art materials (1) | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ○ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | | | ○ | | ✓ |
| Assorted materials for model making and testing | ✓ | ✓ | ○ | ✓ | | ○ | ○ | ✓ | | ○ | ○ | ○ | | | | ✓ | ✓ | ✓ | ○ | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | ○ |
| Band saw | ○ | ○ | | ○ | | | | ✓ | | | | | | | | ✓ | ✓ | ✓ | ○ | ○ | ○ | | | | | | | | | | |
| Basic drafting materials and equipment | ○ | ○ | ○ | ○ | | ✓ | ○ | ○ | | ✓ | ✓ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ○ | | ○ |
| CAD software | | | | | ✓ | ○ | | ○ | ✓ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ○ | | ○ |
| Computers with graphics capability and support software, telecommunication capability, modem, word processing | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Drawing/drafting tables | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | ○ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ○ | | ✓ |
| Display units | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Extensive RAM and storage | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

(1) Art materials might include a variety of pencils (4H, 4B), water colour brushes, poster paint, coloured markers, drawing pens, india ink, charcoal, various types of drawing/sketching paper and card, cutting tools.

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## DESIGN STUDIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Design Skills, Processes and Applications
B. Drafting for Design and Technical Drawing Skills
C. Business/Issues/History

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | A | A | B | B | A | A | B | B | B | C | A | A | A | A | A | A | A | A | A | B | B | B | B | B | B | B | C | C | C |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **EQUIPMENT** | Sketch, Draw & Model | The Design Process | 2-D Design Fundamentals | 3-D Design Fundamentals | CAD Fundamentals | Drafting/Design Fundamentals | 2-D Design Applications | 3-D Design Applications | CAD Applications | Drafting/Design Applications | Technical Drawing Applications | The Evolution of Design | 2-D Design Studio 1 | 2-D Design Studio 2 | 2-D Design Studio 3 | 3-D Design Studio 1 | 3-D Design Studio 2 | 3-D Design Studio 3 | Living Environment Studio 1 | Living Environment Studio 2 | Living Environment Studio 3 | CAD Modelling Studio | Drafting/Design Studio 1 | Drafting/Design Studio 2 | Drafting/Design Studio 3 | Technical Drawing Studio 1 | Technical Drawing Studio 2 | Technical Drawing Studio 3 | Visualizing the Future | The Design Profession | Portfolio Presentation |
| | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 | 3180 | 3190 |
| Hand tools for wood, metal and plastic | ✓ | ✓ | O | ✓ | | | | ✓ | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | |
| Laser printer and plotter | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Storage and drying racks | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Styrofoam cutter | O | O | O | O | | | | ✓ | | | ✓ | | | | | ✓ | ✓ | ✓ | O | O | O | | O | O | O | | | | | | |
| Table saw | O | O | O | O | | | | ✓ | | | | | | | | ✓ | ✓ | ✓ | O | O | O | | | | | | | | | | |
| Video camera and editing equipment | O | O | O | O | | O | O | O | | O | O | O | O | O | O | O | O | O | O | O | O | | O | O | O | | | | O | O | ✓ |
| Vises, wood, plastic and metal | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | |
| Work benches | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | O |
| tables | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | O | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | O | O | ✓ |
| Data lines for computer access to Internet | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Modem line for computer access to Internet | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Scanner | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters for Electro-Technologies

### Facilities

Electro-Technologies programs require specialized equipment and facilities for most courses although simulation software packages can reduce this need somewhat. In planning a facility for Electro-Technologies, ensure to include:

- adequate ventilation for soldering
- adequate space for a resource centre
- water and sinks
- whiteboards/bulletin boards and an overhead screen
- work stations with electrical power outlets and equipment storage
- telephone and cable service.

Courses that require access to facilities in addition to those present in a typical classroom setting are identified in the Course Parameters. For more information, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

### Equipment

An equipment list is provided in the Course Parameters chart. Though not exhaustive, the list identifies recommended and optional equipment necessary to meet the course outcomes. The number, make and model of equipment would be determined locally depending on instructional strategies; e.g., use of simulation programs.

Equipment for courses in Electro-Technologies can be accessed through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers may find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each course.

### Safety and Security Considerations

Maintaining a safe and secure environment is essential when delivering an Electro-Technologies program. The following issues need to be addressed:

- safe laboratory/shop equipment layout
- procedures for laboratory/shop management
- provision for electrical power lockout
- procedures for power use of tools and equipment
- procedures to follow when an accident occurs
- preventative accident/equipment maintenance program.

### Instructional Qualifications

Effective planning and delivery of Electro-Technologies courses is contingent on teachers having content expertise. Industry training and experience are assets, particularly at the intermediate and advanced levels. Courses that are considered for advanced standing in an apprenticeship trade require a teacher/instructor possessing a Journeyman Certificate in that trade. In courses where customer work and high current and voltages exist, the teacher must also possess a Journeyman Certificate.

Courses requiring additional instructor credentials are identified in the Course Parameters chart. For more information regarding each instructor credential, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

**Credentialling Opportunities**

While this strand provides students with opportunities to demonstrate competencies recognized by industry and post-secondary institutions, there are no credentialling opportunities identified at this time.

## Course Parameters

## *ELECTRO-TECHNOLOGIES*

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Fabrication and Service Principles
B. Power Systems
C. Computer Logic Systems
D. Communication Systems
E. Robotic and Control Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | B | B | C | C | D | D | D | E | A | A | B | B | C | C | C | D | D | D | D | E | E | E |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | * | | | | | | | | | | | * |
| INSTRUCTIONAL FACILITIES | * | * | | * | * | * | * | * | * | * | * | * | | | | | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | | | | | | | | | | |
| **EQUIPMENT** | Electro-assembly 1 | Conversion & Distribution | Electronic Power Supply 1 | Digital Technology 1 | Control Systems 1 | Analog Communication 1 | Electronic Communication | Security Systems 1 | Robotics 1 | Electro-assembly 2 | Electrical Servicing | Branch Circuit Wiring | Electronic Power Supply 2 | Digital Technology 2 | Computer Technology | Control Systems 2 | Analog Communication 2 | Radio Communication | Security Systems 2 | Electro-optics | Magnetic Control Devices | Robotics 2 | Electronic Controls |
| | 1010 | 1030 | 1050 | 1060 | 1080 | 1090 | 1100 | 1110 | 1130 | 2010 | 2020 | 2030 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 |
| Ammeter, clamp-on | ✓ | ✓ | | | | ✓ | ✓ | | | | ✓ | ✓ | | | | | | | | | ✓ | | ✓ |
| Analog V.O.M. | ✓ | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Bread board holder | ✓ | | ✓ | | | | | ✓ | ✓ | | | | | | | | | | | | | | |
| Capacitance meter | ✓ | | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Coaxial cable stripper | ✓ | | | | | | | | | | | | | | | | | | | | | | |
| Computer/printer/modem | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ○ | ○ | ✓ | ✓ |
| Conduit bender | | ✓ | | | | | | | | | ✓ | | | | | | | | | | | | |
| Desoldering bulb | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| wick | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Digital logic trainer | | | | | | | | | | | | | | ✓ | | | | | ✓ | | | | ✓ |

*** Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.**

## Course Parameters

## ELECTRO-TECHNOLOGIES

LEVEL
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3 – Advanced

THEME
A. Fabrication and Service Principles
B. Power Systems
C. Computer Logic Systems
D. Communication Systems
E. Robotic and Control Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | A | B | B | C | C | C | C | D | D | D | E | E | E |
| INSTRUCTIONAL QUALIFICATIONS | | | * | * | | | | | | | | * | | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | * | | | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | |
| **EQUIPMENT** | Electro-assembly 3 | Electronic Servicing | Power Systems & Services | Generation/Transformation | Digital Technology 3 | Digital Applications | Microprocessors | Microprocessor Interface | Analog Communication 3 | Amplifiers | Data/Telemetry Systems | Motors | Robotics 3 | Control Applications |
| | 3010 | 3020 | 3030 | 3040 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3130 | 3140 | 3150 | 3160 |
| Ammeter, clamp-on | | ✓ | ✓ | ✓ | | | | | | | | ✓ | | |
| Analog V.O.M. | | | | | | | | | | | | | | |
| Bread board holder | ✓ | | | | | | | | | | | | | |
| Capacitance meter | ✓ | ✓ | | | ✓ | ✓ | | | ✓ | ✓ | | | ✓ | |
| Coaxial cable stripper | | ✓ | | | | | | | | | | | | |
| Computer/printer/modem | O | ✓ | O | O | ✓ | ✓ | ✓ | ✓ | ✓ | O | ✓ | O | ✓ | O |
| Conduit bender | | | | | | | | | | | | | | |
| Desoldering bulb | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| wick | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Digital logic trainer | | | | | ✓ | ✓ | ✓ | ✓ | | | ✓ | | ✓ | |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## ELECTRO-TECHNOLOGIES

LEVEL
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D. Communication Systems
E. Robotic and Control Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| EQUIPMENT | Electro-assembly 1 1010 | Conversion & Distribution 1030 | Electronic Power Supply 1 1050 | Digital Technology 1 1060 | Control Systems 1 1080 | Analog Communication 1 1090 | Electronic Communication 1100 | Security Systems 1 1110 | Robotics 1 1130 | Electro-assembly 2 2010 | Electrical Servicing 2020 | Branch Circuit Wiring 2030 | Electronic Power Supply 2 2050 | Digital Technology 2 2060 | Computer Technology 2070 | Control Systems 2 2080 | Analog Communication 2 2090 | Radio Communication 2100 | Security Systems 2 2110 | Electro-optics 2120 | Magnetic Control Devices 2130 | Robotics 2 2140 | Electronic Controls 2150 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | B | B | C | C | D | D | D | E | A | A | B | B | C | C | C | D | D | D | D | E | E | E |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | * | | | | | | | | | | | * |
| INSTRUCTIONAL FACILITIES | * | * | | * | * | * | * | * | * | * | * | * | | | | | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | | | | | | | | | | |
| Digital multimeter | O | | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Drill press | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | | | | | | | | ✓ | | | ✓ | ✓ |
| Fibre optics training kit | | | | | | | | | | | | | | | | | | | | ✓ | | | |
| Frequency counter | | | | | | | | | | | | | | ✓ | | | ✓ | ✓ | | | | | |
| Function generator | | | | | | ✓ | ✓ | | | | ✓ | | | ✓ | | | ✓ | ✓ | | | | | |
| Heat sinks | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Heavy duty utility pliers (channel lock) | | ✓ | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| High voltage probe | | | | | | | | | | | ✓ | | | | | | | | | | | | |
| I/E insertion/removal tool | ✓ | | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | |
| Inductance meter | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Isolation transformer | | | | | | | | | | ✓ | | | ✓ | | | | ✓ | ✓ | | | | | ✓ |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Fabrication and Service Principles
B. Power Systems
C. Computer Logic Systems
D. Communication Systems
E. Robotic and Control Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | A | B | B | C | C | C | C | D | D | D | E | E | E |
| INSTRUCTIONAL QUALIFICATIONS | | | * | * | | | | | | | | * | | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | * | | | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | |
| **EQUIPMENT** | Electro-assembly 3 | Electronic Servicing | Power Systems & Services | Generation/Transformation | Digital Technology 3 | Digital Applications | Microprocessors | Microprocessor Interface | Analog Communication 3 | Amplifiers | Data/Telemetry Systems | Motors | Robotics 3 | Control Applications |
| | 3010 | 3020 | 3030 | 3040 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3130 | 3140 | 3150 | 3160 |
| Digital multimeter | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Drill press | ✓ | ✓ | | | | | | | | | | ✓ | ✓ | ✓ |
| Fibre optics training kit | | | | | | | | | | | | | | |
| Frequency counter | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| Function generator | ✓ | ✓ | | | ✓ | ✓ | | | ✓ | ✓ | | | ✓ | |
| Heat sinks | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Heavy duty utility pliers (channel lock) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| High voltage probe | | ✓ | | | | | | | | | | ✓ | | |
| I/E insertion/removal tool | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | |
| Inductance meter | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Isolation transformer | ✓ | ✓ | ✓ | ✓ | | | | | | ✓ | | ✓ | ✓ | ✓ |

***** **Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.**

## Course Parameters

## ELECTRO-TECHNOLOGIES

LEVEL
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A. Fabrication and Service Principles
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D. Communication Systems
E. Robotic and Control Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | B | B | C | C | D | D | D | E | A | A | B | B | C | C | C | D | D | D | D | E | E | E |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | * | | | | | | | | | | | * |
| INSTRUCTIONAL FACILITIES | * | * | | * | * | * | * | * | * | * | * | * | | | | | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | | | | | | | | | | |
| **EQUIPMENT** | Electro-assembly 1 | Conversion & Distribution | Electronic Power Supply 1 | Digital Technology 1 | Control Systems 1 | Analog Communication 1 | Electronic Communication | Security Systems 1 | Robotics 1 | Electro-assembly 2 | Electrical Servicing | Branch Circuit Wiring | Electronic Power Supply 2 | Digital Technology 2 | Computer Technology | Control Systems 2 | Analog Communication 2 | Radio Communication | Security Systems 2 | Electro-optics | Magnetic Control Devices | Robotics 2 | Electronic Controls |
| | 1010 | 1030 | 1050 | 1060 | 1080 | 1090 | 1100 | 1110 | 1130 | 2010 | 2020 | 2030 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 |
| Jeweler screwdriver | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Laser training kit | | | | | | | | | | | | | | | | | | | | ✓ | | | |
| Lead bender and crimper | ✓ | | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Lineman's pliers | ✓ | ✓ | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Logic probe | O | | ✓ | ✓ | | | | ✓ | ✓ | | | | | ✓ | ✓ | | | | ✓ | | | ✓ | |
| Microprocessor trainer | | | | | | | | | | | | | | | | | | | | | ✓ | | |
| Modular crimping tool | ✓ | | | | | | | | | | | | | | | | | | | | | | |
| Multipurpose tool | ✓ | ✓ | ✓ | | | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Needle nose pliers | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Nonmetallic sheath cable strippers | | ✓ | | | | | | | | | | ✓ | | | | | | | | | | | |

*** Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.**

## Course Parameters

## *ELECTRO-TECHNOLOGIES*

LEVEL
1 – Introductory
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3 – Advanced

THEME
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D. Communication Systems
E. Robotic and Control Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | B | B | C | C | C | C | D | D | D | E | E | E |
| INSTRUCTIONAL QUALIFICATIONS | | | * | * | | | | | | | | * | | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | * | | | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | |
| **EQUIPMENT** | Electro-assembly 3 | Electronic Servicing | Power Systems & Services | Generation/Transformation | Digital Technology 3 | Digital Applications | Microprocessors | Microprocessor Interface | Analog Communication 3 | Amplifiers | Data/Telemetry Systems | Motors | Robotics 3 | Control Applications |
| | 3010 | 3020 | 3030 | 3040 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3130 | 3140 | 3150 | 3160 |
| Jeweler screwdriver | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Laser training kit | | | | | | | | | | | | | ✓ | |
| Lead bender and crimper | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Lineman's pliers | | | ✓ | ✓ | | | | | | | | ✓ | | |
| Logic probe | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Microprocessor trainer | | | | | ✓ | ✓ | ✓ | | | | | | ✓ | ✓ |
| Modular crimping tool | | ✓ | | | | | | ✓ | | | ✓ | | | |
| Multipurpose tool | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Needle nose pliers | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Nonmetallic sheath cable strippers | | | ✓ | ✓ | | | | | | | | | | |

*** Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.**

## Course Parameters

## *ELECTRO-TECHNOLOGIES*

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THEME
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EQUIPMENT
✓ Recommended in order to meet course outcomes
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| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | B | B | C | C | D | D | D | E | A | A | B | B | C | C | C | D | D | D | D | E | E | E |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | * | | | | | | | | | | | * |
| INSTRUCTIONAL FACILITIES | * | * | | * | * | * | * | * | * | * | * | * | | | | | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | | | | | | | | | | |
| **EQUIPMENT** | Electro-assembly 1 | Conversion & Distribution | Electronic Power Supply 1 | Digital Technology 1 | Control Systems 1 | Analog Communication 1 | Electronic Communication | Security Systems 1 | Robotics 1 | Electro-assembly 2 | Electrical Servicing | Branch Circuit Wiring | Electronic Power Supply 2 | Digital Technology 2 | Computer Technology | Control Systems 2 | Analog Communication 2 | Radio Communication | Security Systems 2 | Electro-optics | Magnetic Control Devices | Robotics 2 | Electronic Control |
| | 1010 | 1030 | 1050 | 1060 | 1080 | 1090 | 1100 | 1110 | 1130 | 2010 | 2020 | 2030 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 |
| Nut drivers, 1/4 inch and 1/2 inch | ✓ | | ✓ | | | | | ✓ | ✓ | ✓ | | | | | | | | | ✓ | | | ✓ | |
| Oscilloscope | | | | | | ✓ | ✓ | | | | ✓ | | ✓ | | | | ✓ | ✓ | | | | ✓ | |
| Programmable logic controller | | | | | | | | ✓ | | | | | | | | | | | ✓ | | | | ✓ |
| Printed circuit fabrication kit | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ✓ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| R.F. generator | | | | | | | | | | | | | | | | | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| Regulated power supply | | ✓ | ✓ | | | ✓ | ✓ | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Screwdrivers, assorted | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

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**Course Parameters**

**ELECTRO-TECHNOLOGIES**

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○ Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | B | B | C | C | C | C | D | D | D | E | E | E |
| INSTRUCTIONAL QUALIFICATIONS | | | * | * | | | | | | | | * | | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | * | | | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | |
| **EQUIPMENT** | Electro-assembly 3 | Electronic Servicing | Power Systems & Services | Generation/Transformation | Digital Technology 3 | Digital Applications | Microprocessors | Microprocessor Interface | Analog Communication 3 | Amplifiers | Data/Telemetry Systems | Motors | Robotics 3 | Control Applications |
| | 3010 | 3020 | 3030 | 3040 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3130 | 3140 | 3150 | 3160 |
| Nut drivers, 1/4 inch and 1/2 inch | ✓ | ✓ | | | | | | | | | | ✓ | ✓ | ✓ |
| Oscilloscope | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Programmable logic controller | | | | | | | | ✓ | | | | | ✓ | ✓ |
| Printed circuit fabrication kit | ✓ | ○ | | | ○ | ○ | | | ○ | ○ | | | ○ | ○ |
| R.F. generator | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Regulated power supply | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Screwdrivers, assorted | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

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EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | B | B | C | C | D | D | D | E | A | A | B | B | C | C | C | D | D | D | D | E | E | E |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | * | | | | | | | | | | | * |
| INSTRUCTIONAL FACILITIES | * | * | | * | * | * | * | * | * | * | * | * | | | | | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | | | | | | | | | | |
| **EQUIPMENT** | Electro-assembly 1 | Conversion & Distribution | Electronic Power Supply 1 | Digital Technology 1 | Control Systems 1 | Analog Communication 1 | Electronic Communication | Security Systems 1 | Robotics 1 | Electro-assembly 2 | Electrical Servicing | Branch Circuit Wiring | Electronic Power Supply 2 | Digital Technology 2 | Computer Technology | Control Systems 2 | Analog Communication 2 | Radio Communication | Security Systems 2 | Electro-optics | Magnetic Control Devices | Robotics 2 | Electronic Controls |
| | 1010 | 1030 | 1050 | 1060 | 1080 | 1090 | 1100 | 1110 | 1130 | 2010 | 2020 | 2030 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 |
| Soldering gun/pencil/station | ✓ | ✓ | ✓ | ✓ | ✓ | O | O | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Sound meter dB | | | | | | ✓ | ✓ | | | | | | | | | | ✓ | ✓ | ✓ | | | | |
| Standard swivel head | ✓ | ✓ | | | | | | ✓ | ✓ | | | | | | | | | | | | | | |
| Tape measure | ✓ | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Test light | ✓ | ✓ | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Torx screwdriver | ✓ | ✓ | | | | | ✓ | | ✓ | ✓ | ✓ | | | | | | | | ✓ | | | ✓ | |
| Transistor tester | | | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | |
| TV dot bar generator | | | | | | | | | | | | | | | | | | | | | | | |
| Utility knife | ✓ | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Vacuum-based vise | ✓ | | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | | ✓ | |
| Wattmeter | | | | | | | | | | | | | ✓ | | | | ✓ | | | | | | |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

**Course Parameters**

## ELECTRO-TECHNOLOGIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Fabrication and Service Principles
B. Power Systems
C. Computer Logic Systems
D. Communication Systems
E. Robotic and Control Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | B | B | C | C | C | C | D | D | D | E | E | E |
| INSTRUCTIONAL QUALIFICATIONS | | | • | • | | | | | | | | • | | • |
| INSTRUCTIONAL FACILITIES | • | • | • | • | • | • | • | | | | • | • | • | • |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | |
| **EQUIPMENT** | Electro-assembly 3 | Electronic Servicing | Power Systems & Services | Generation/Transformation | Digital Technology 3 | Digital Applications | Microprocessors | Microprocessor Interface | Analog Communication 3 | Amplifiers | Data/Telemetry Systems | Motors | Robotics 3 | Control Applications |
| | 3010 | 3020 | 3030 | 3040 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3130 | 3140 | 3150 | 3160 |
| Soldering gun/pencil/station | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Sound meter dB | | ✓ | | | | | | | ✓ | ✓ | | | | |
| Standard swivel head | | | | | | | | | | | | | | |
| Tape measure | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Test light | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Torx screwdriver | ✓ | ✓ | | | | | | | | | | | ✓ | ✓ |
| Transistor tester | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| TV dot bar generator | | ✓ | | | | | | | | | | | | |
| Utility knife | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Vacuum-based vise | ✓ | ✓ | | | | | | | ✓ | | | | ✓ | |
| Wattmeter | | | ✓ | ✓ | | | | | ✓ | ✓ | | ✓ | | |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## ELECTRO-TECHNOLOGIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Fabrication and Service Principles
B. Power Systems
C. Computer Logic Systems
D. Communication Systems
E. Robotic and Control Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | B | B | C | C | D | D | D | E | A | A | B | B | C | C | C | D | D | D | D | E | E | E |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | * | | | | | | | | | | | * |
| INSTRUCTIONAL FACILITIES | * | * | | * | * | * | * | * | * | * | * | * | | | | | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | | | | | | | | | | |
| **EQUIPMENT** | Electro-assembly 1 | Conversion & Distribution | Electronic Power Supply 1 | Digital Technology 1 | Control Systems 1 | Analog Communication 1 | Electronic Communication | Security Systems 1 | Robotics 1 | Electro-assembly 2 | Electrical Servicing | Branch Circuit Wiring | Electronic Power Supply 2 | Digital Technology 2 | Computer Technology | Control Systems 2 | Analog Communication 2 | Radio Communication | Security Systems 2 | Electro-optics | Magnetic Control Devices | Robotics 2 | Electronic Controls |
| | 1010 | 1030 | 1050 | 1060 | 1080 | 1090 | 1100 | 1110 | 1130 | 2010 | 2020 | 2030 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 |
| Wire gauge | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Wire stripper | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Wirecutters, 100 mm | ✓ | ✓ | | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 200 mm | ✓ | ✓ | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## ELECTRO-TECHNOLOGIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Fabrication and Service Principles
B. Power Systems
C. Computer Logic Systems
D. Communication Systems
E. Robotic and Control Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | B | B | C | C | C | C | D | D | D | E | E | E |
| INSTRUCTIONAL QUALIFICATIONS | | | * | * | | | | | | | | * | | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | * | | | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | |
| **EQUIPMENT** | Electro-assembly 3 | Electronic Servicing | Power Systems & Services | Generation/Transformation | Digital Technology 3 | Digital Applications | Microprocessors | Microprocessor Interface | Analog Communication 3 | Amplifiers | Data/Telemetry Systems | Motors | Robotics 3 | Control Applications |
| | 3010 | 3020 | 3030 | 3040 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3130 | 3140 | 3150 | 3160 |
| Wire gauge | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Wire stripper | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Wirecutters, 100 mm | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 200 mm | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters for Energy and Mines

### Facilities

Some courses in the Energy and Mines scope and sequence can be delivered in a typical classroom setting. Refer to Attachment 4: CTS without Labs in this appendix. Others require access to more specialized in-school and off-campus facilities, such as:

- outdoor environments
- science, design, construction, fabrication and mechanics laboratories
- observation and training sites sponsored by relevant industry, government and/or post-secondary agencies
- resource centres equipped with computer hardware/software and audio-visual material.

Also desirable, though not essential, are instructional facilities that have:

- water and sinks
- display and storage areas for specimens and artifacts
- whiteboards/bulletin boards
- fresh air and fume extraction
- an exterior exit
- telephone service.

Courses that require access to facilities in addition to those present in a typical classroom setting are identified in the Course Parameters. For more information, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

### Equipment

An equipment list is provided in the Course Parameters chart. Though not exhaustive, the list identifies recommended and optional equipment for meeting the course outcomes.

Equipment for courses in Energy and Mines can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers may find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each course.

### Safety Considerations

Facilities used to support an Energy and Mines program must ensure a safe learning/working environment. Students must be aware of federal, provincial and local regulations governing the tasks they perform, and adhere to appropriate personal and environmental health and safety procedures in courses that involve:

- the use of specialized hand/power equipment
- the handling and storage of hazardous materials
- field-based investigations.

Students must understand immediate and potential hazards associated with the tasks they perform, and the possible impact of these hazards on self, others and the environment.

### Instructional Qualifications

Courses in Energy and Mines can be implemented by Alberta Certified Teachers who have interest in providing instruction in classroom, laboratory and/or outdoor environments. A background in science, social studies and/or relevant industry; i.e., resource exploration, recovery or production, is an asset to those who provide instruction in Energy and Mines courses, particularly at the intermediate and advanced levels. Teachers may find it desirable to access sources of instructional support available from industry, professional associations and consultants, and relevant government agencies; e.g., Alberta Energy.

### Credentialling Opportunities

Some courses within the Energy and Mines strand provide opportunities for students to earn either complete or partial credentials recognized by business, industry and/or post-secondary institutions. Courses that link with credentialling opportunities relevant to the exploration, recovery and/or production sectors are identified in the Course Parameters chart. For more information regarding the credential, requirement/qualification and credentialling agency, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

## Course Parameters

## *ENERGY AND MINES*

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Social and Cultural Perspectives
B. Technology and Applications
C. Management and Conservation

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| EQUIPMENT | Overview of Alberta Geology | Nonrenewable Resources | Renewable Resources | Consumer Products & Services | Fundamentals of Recycling | Conservation Challenge | Managing Alberta's Resources | Conventional Oil/Gas 1 | Oil Sands/Heavy Oil/Coal 1 | Metals/Nonmetals 1 | Renewable Energy Technology | Refining Hydrocarbons | Refining Rocks & Minerals | Supply & Distribution | Energy Designs/Systems 1 | Environmental Safety | Energy & the Environment | Conventional Oil/Gas 2 | Oil Sands/Heavy Oil/Coal 2 | Metals/Nonmetals 2 | Sustainable Energy | Petrochemicals | Industrial Materials | Market Basics & Trends | Energy Designs/Systems 2 | Integrated Resource Management |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | B | B | B | C | C | A | B | B | B | B | B | B | B | C | C | A | B | B | B | B | B | B | B | C | C |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | | | | | | | | | | | | |
| INSTRUCTIONAL FACILITIES | | * | * | * | * | | | * | * | * | * | * | * | | * | | | * | * | * | | * | * | | * | |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | * | | | | | | * | | * | | * | | | | | | | | |
| | 1010 | 1020 | 1050 | 1060 | 1090 | 1100 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 |
| Anemometer | | | O | | | | | | | | O | | | | | | | | | | | | | | | |
| Blueprints, home, office | | | | | | | | | | | | | | | ✓ | | | | | | | | | | ✓ | |
| Computer and software | | | | | | O | | | | | | | | | O | | | | | | | | | | O | |
| Electrical generator | | | ✓ | | | | | | | | O | | | | | | | | | | | | | | | |
| Fuel cell | | | O | | | | | | | | O | | | | | | | | | | | | | | | |
| Gas detector | | O | | | | | | O | O | O | | | | | | | | O | O | O | | | | | | |
| Kit, air testing | | | | | | O | | | O | | | | | | | | O | | | | | | | | | |
| soil testing | | | | | | O | | | O | | | | | | | | O | | | | | | | | | |
| water testing | | | | | | O | | | O | | | | | | | | O | | | | | | | | | |
| Magnifying glass, large | | | O | | | | | | | | O | | | | | | | | | | | | | | | |
| Maps, aerial | | O | | | | | | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| geological | ✓ | ✓ | | | | | | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| meteorological | | | | | | | | | | | | | | | ✓ | | | | | | | | | | ✓ | |
| topographical | ✓ | | | | | | | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| Meter, pH testing | | | | | | O | | | | | | | | | | | O | | | | | | | | | |

***** **Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.**

## Course Parameters

***ENERGY AND MINES***

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Social and Cultural Perspectives
B. Technology and Applications
C. Management and Conservation

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | B | B | B | C | C | A | B | B | B | B | B | B | B | C | C | A | B | B | B | B | B | B | B | C | C |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | | | | | | | | | | | | |
| INSTRUCTIONAL FACILITIES | | * | * | * | * | | | * | * | * | * | * | * | | * | | | * | * | * | | * | * | | * | |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | * | | | | | | * | | * | | * | | | | | | | | |
| **EQUIPMENT** | Overview of Alberta Geology | Nonrenewable Resources | Renewable Resources | Consumer Products & Services | Fundamentals of Recycling | Conservation Challenge | Managing Alberta's Resources | Conventional Oil/Gas 1 | Oil Sands/Heavy Oil/Coal 1 | Metals/Nonmetals 1 | Renewable Energy Technology | Refining Hydrocarbons | Refining Rocks & Minerals | Supply & Distribution | Energy Designs/Systems 1 | Environmental Safety | Energy & the Environment | Conventional Oil/Gas 2 | Oil Sands/Heavy Oil/Coal 2 | Metals/Nonmetals 2 | Sustainable Energy | Petrochemicals | Industrial Materials | Market Basics & Trends | Energy Designs/Systems 2 | Integrated Resource Management |
| | 1010 | 1020 | 1050 | 1060 | 1090 | 1100 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 |
| Mirror, parabolic | | | O | | | | | | | | O | | | | | | | | | | | | | | | |
| Model, combustion engine | | | | | | | | | | | | | | | | | | | | | O | | | | | |
| Model, energy efficient structure | | | | | | | | | | | | | | | ✓ | | O | | | | | | | | ✓ | |
| Personal safety gear (1) | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | ✓ | | ✓ | ✓ | | | |
| Sample products, coal | | ✓ | | ✓ | | | | | | | | | ✓ | | | | | | | | | | | | | |
| mineral | | ✓ | | ✓ | | | | | | | | | ✓ | | | | | | | | | | ✓ | | | |
| petrochemical | | ✓ | | ✓ | | | | | | | | | | | | | | O | | | | ✓ | | | | |
| petroleum | | ✓ | | | | | | | | | | ✓ | | | | | | ✓ | ✓ | | | ✓ | | | | |
| Sample drill cores | O | O | | | | | | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| Solar cell | | | O | | | | | | | | ✓ | | | | | | | | | | O | | | | | |
| collector panel | | | O | | | | | | | | ✓ | | | | | | | | | | | | | | | |
| Specimen set, rock and mineral | ✓ | ✓ | | | | | | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| Table, drafting | | | | | | | | | | | | | | | O | | | | | | | | | | O | |
| Turbine, water | | | O | | | | | | | | ✓ | | | | | | | | | | | | | | | |
| wind | | | O | | | | | | | | ✓ | | | | | | | | | | | | | | | |

(1) Personal safety gear includes hard hat, safety glasses, ear protectors, gloves, respirator, steel-toed boots, as required.

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters for Fabrication Studies

### Facilities

CTS programs centred around Fabrication Studies should include courses that link with facilities that are readily available in the school and/or community. When selecting or planning a facility for Fabrication Studies, ensure:

- adequate space for instruction
- ample storage space for materials and projects
- adequate services to run the equipment
- provision for fume extraction and welding curtains
- access to water and service doors
- appropriate ambient features that promote learning
- fire protection.

Courses that require access to facilities in addition to those present in a typical classroom setting are identified in the Course Parameters. For more information, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation.*

### Equipment

A recommended equipment list is provided in the Course Parameters chart. Though not exhaustive, the list identifies equipment recommended as necessary to meet the course outcomes and equipment that is considered optional. Specific makes and models of equipment are to be determined at the local level.

Equipment for courses in Fabrication Studies can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers may find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each course.

### Safety Considerations

A number of safety issues relate to the maintenance and use of specialized power equipment, handling and storage of materials and behaviour of students while working in a shop environment. Extra care should be taken to ensure that facilities and equipment are well maintained and that students understand and practise safe work habits at all times. In addition, it is also important to have procedures in place to lock out gas and power services as well as to secure tools and material supplies.

### Instructional Qualifications

Due to the nature of the Fabrication Studies strand, most courses require some form of specialized training provided primarily by recognized institutions responsible for occupational, technical or teacher preparation. Other forms of specialized training may also be provided through training seminars, workshops and other short courses. However, if a course is to be used to gain advanced standing in an apprenticeable trade, instruction must be provided by a teacher/instructor with journeyman qualifications.

Courses requiring additional instructor credentials are identified in the Course Parameters chart. For more information, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation.*

## Credentialling Opportunities

Students may earn credentials recognized by business, industry and post-secondary institutions by demonstrating a specific set of competencies. Based on an articulation agreement established with the Apprenticeship and Industry Training Division, Alberta Advanced Education and Career Development, students who complete specified CTS courses may be eligible to obtain advanced standing in the apprenticeship program for Welder. Further details regarding each articulation agreement, including a correlation to CTS strands and courses, are provided in Appendix 5: Planning Ahead—CTS Transitions into Post-secondary Programs and the Workplace. Additional information can be obtained by contacting the Apprenticeship and Industry Training Division, Alberta Advanced Education and Career Development. A list of local Career Development Centres throughout Alberta is also provided in Appendix 5: Planning Ahead—CTS Transitions into Post-secondary Programs and the Workplace

For more information regarding the credential, requirement/qualification and credentialling agency, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

## Course Parameters

## *FABRICATION STUDIES*

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Materials and Structures
B. Fabrication Processes
C. Production Systems and Processes

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | B | B | B | B | B | C | C | C | A | A | B | B | B | B | B | B | B | B | C | C | C | C | C | B |
| INSTRUCTIONAL QUALIFICATIONS | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | * | * | * | | * | * | | | | | * | * | * | * | * | * | | | | | | | | * | |
| **EQUIPMENT** | Basic Tools & Materials | Oxyacetylene Welding | Basic Electric Welding | Sheet Fabrication 1 | Fabrication Principles | Bar & Tubular Fabrication | Foundry 1 | Principles of Machining | Production Systems | Structural Engineering | Print Reading | Oxyfuel Welding | Thermal Cutting | Arc Welding 1 | Arc Welding 2 | Gas Metal Arc Welding 1 | Sheet Fabrication 2 | Sheet Fabrication 3 | Forging Fundamentals | Foundry 2 | Precision Turning 1 | Precision Milling 1 | CNC Turning | Custom Fabrication | Pipe Fitting |
| | CON | 1040 | 1050 | 1090 | 1100 | 1110 | 1120 | 1130 | 1160 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 |
| Basic set of hand tools (1) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ○ | ✓ | ✓ |
| Anvil | ○ | ○ | ○ | ○ | ○ | ✓ | | | ○ | | | ○ | | | | | | | ✓ | | | | | ○ | |
| Bench, equipment | ✓ | | | ✓ | ✓ | ✓ | | ✓ | ○ | ○ | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | | ○ | |
| Bench, metal working | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | ✓ | ✓ | ✓ | ○ | ○ | ○ | | ✓ | |
| Bender c/w accessories | ○ | | | ○ | ○ | ✓ | | | | | | | | | | | | | ○ | | | | | ○ | ○ |
| Brake, box and pan | ○ | | | ✓ | ○ | | | | | | | | | | | | ✓ | ✓ | | | | | | ○ | |
| Buffer, metal (cloth and wire wheel) | ○ | ✓ | ✓ | | ○ | ✓ | ○ | ○ | ○ | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | ○ | |
| Cabinet, paint storage | ✓ | | | | ○ | ✓ | | | ○ | | | | | | | | | | ○ | | | | | ○ | |
| Computer c/w printer | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ✓ | ○ | ○ |
| Cutter, plasma arc | | | | ○ | ○ | | | | ○ | | | | ✓ | | | | ○ | ○ | | | | | | ○ | |
| Drill press (floor or bench) | ○ | ○ | | ○ | ✓ | ✓ | ○ | ✓ | ○ | | | | | | | | ○ | ○ | ○ | | ○ | ○ | | ○ | |
| Drill set (met/imp) | ✓ | ○ | | ✓ | ✓ | ✓ | ✓ | ✓ | ○ | ✓ | | | | | | | ○ | ○ | ○ | | ✓ | ✓ | ✓ | ○ | |

(1) A basic set of hand tools might include calipers, chisel, assorted clamps, dividers, file card, assorted files and hammers, putty knife, micrometer, pliers, centre punch, steel ruler, screwdrivers, scriber, tinsnips, soldering iron, combination square and measuring tape.

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## *FABRICATION STUDIES*

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Materials and Structures
B. Fabrication Processes
C. Production Systems and Processes

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | B | B | B | B | B | B | B | B | C | C | C | C | C | B |
| INSTRUCTIONAL QUALIFICATIONS | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | * | * | * | * | * | * | | | | | | | | * | * |
| EQUIPMENT | Materials Testing | Metallurgy Fundamentals | Gas Tungsten Arc Welding | Specialized Welding | Arc Welding 3 | Arc Welding 4 | Pipe & Tubular Welding | Automated Welding | Sheet Fabrication 4 | Sheet Fabrication 5 | Foundry 3 | Precision Turning 2 | Precision Milling 2 | CNC Milling | Prefabrication Principles | Gas Metal Arc Welding 2 |
| | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 |
| Basic set of hand tools (1) | ✓ | O | ✓ | ✓ | ✓ | ✓ | ✓ | O | ✓ | ✓ | ✓ | ✓ | ✓ | O | ✓ | ✓ |
| Anvil | O | | | | | | | | | | | | | | O | |
| Bench, equipment | | | | | | | | | O | | | O | O | | O | |
| Bench, metal working | ✓ | ✓ | | | | | | | ✓ | ✓ | | O | O | | O | |
| Bender c/w accessories | | | | | | | | | | | | | | | O | |
| Brake, box and pan | | | | | | | | | O | ✓ | | | | | O | |
| Buffer, metal (cloth and wire wheel) | O | O | | | | | O | | | | | | | | O | |
| Cabinet, paint storage | | | | | | | | | | | | | | | O | |
| Computer c/w printer | O | O | O | O | O | O | O | O | O | O | O | O | O | ✓ | O | O |
| Cutter, plasma arc | | | | | | | | | | | | | | | O | |
| Drill press (floor or bench) | | | | | | | | | O | O | | O | O | | O | |
| Drill set (met/imp) | | | | | | | | | ✓ | ✓ | | ✓ | | ✓ | O | |

(1) A basic set of hand tools might include calipers, chisel, assorted clamps, dividers, file card, assorted files and hammers, putty knife, micrometer, pliers, centre punch, steel ruler, screwdrivers, scriber, tin snips, soldering iron, combination square and measuring tape.

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Materials and Structures
B. Fabrication Processes
C. Production Systems and Processes

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | B | B | B | B | B | C | C | C | A | A | B | B | B | B | B | B | B | B | C | C | C | C | C | B |
| INSTRUCTIONAL QUALIFICATIONS | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | * | * | * | | * | * | | | | | * | * | * | * | * | * | | | | | | | | * | |
| **EQUIPMENT** | Basic Tools & Materials | Oxyacetylene Welding | Basic Electric Welding | Sheet Fabrication 1 | Fabrication Principles | Bar & Tubular Fabrication | Foundry 1 | Principles of Machining | Production Systems | Structural Engineering | Print Reading | Oxyfuel Welding | Thermal Cutting | Arc Welding 1 | Arc Welding 2 | Gas Metal Arc Welding 1 | Sheet Fabrication 2 | Sheet Fabrication 3 | Forging Fundamentals | Foundry 2 | Precision Turning 1 | Precision Milling 1 | CNC Turning | Custom Fabrication | Pipe Fitting |
| | CON | 1040 | 1050 | 1090 | 1100 | 1110 | 1120 | 1130 | 1160 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 |
| Drill, portable, heavy duty, variable speed, reversible | ✓ | O | | ✓ | ✓ | O | O | O | O | O | | | | | | | | | | | | | | O | |
| Folder, bar | | | | | O | | | | O | | | | | | | | O | ✓ | | | | | | O | |
| Forge, gas fired | | | | | O | O | | | | | | | | | | | | | ✓ | | | | | O | |
| Former, vacuum | | | | O | O | | | | | | | | | | | | | | | | | O | | | |
| Furnace, foundry c/w accessories | | | | | O | | ✓ | | O | | | | | | | | | | | ✓ | | | | O | |
| heat treating | | | | | O | | | | | | | | | | | | | | O | | | | | O | |
| soldering | | | | O | O | O | O | | O | | | | | | | | O | O | | | | | | O | ✓ |
| Grinder, angle | | ✓ | | | O | ✓ | | | | | | O | O | O | O | O | | | | | | | | O | ✓ |
| heavy duty | | ✓ | ✓ | | O | ✓ | O | O | O | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | O | O | | | | O | |
| tool (bench) | ✓ | ✓ | | O | ✓ | ✓ | | ✓ | O | | | | | | | | | | | | ✓ | ✓ | | O | |
| Heater, strip | | | | O | O | | | | | | | | | | | | | | | | | | | | |
| Lathe, CNC, c/w accessories | | | | | O | | | | O | | | | | | | | | | | | O | | ✓ | O | |

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* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## *FABRICATION STUDIES*

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Materials and Structures
B. Fabrication Processes
C. Production Systems and Processes

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | B | B | B | B | B | B | B | B | C | C | C | C | C | B |
| INSTRUCTIONAL QUALIFICATIONS | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | * | * | * | * | * | * | | | | | | | | * | * |
| **EQUIPMENT** | Materials Testing | Metallurgy Fundamentals | Gas Tungsten Arc Welding | Specialized Welding | Arc Welding 3 | Arc Welding 4 | Pipe & Tubular Welding | Automated Welding | Sheet Fabrication 4 | Sheet Fabrication 5 | Foundry 3 | Precision Turning 2 | Precision Milling 2 | CNC Milling | Prefabrication Principles | Gas Metal Arc Welding 2 |
| | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 |
| Drill, portable, heavy duty, variable speed, reversible | | | | | | | | | O | O | | | | | O | |
| Folder, bar | | | | | | | | | ✓ | ✓ | | | | | O | |
| Forge, gas fired | | | | | | | | | | | | | | | O | |
| Former, vacuum | | | | | | | | | | | | | O | | | |
| Furnace, foundry c/w accessories | | | | | | | | | | | ✓ | | | | O | |
| heat treating | | ✓ | | | | | | | | | | | | | O | |
| soldering | | | | | | | | | O | O | | | | | O | |
| Grinder, angle | | | O | O | ✓ | ✓ | ✓ | O | | | | | | | O | ✓ |
| heavy duty | O | O | O | O | ✓ | ✓ | ✓ | O | | | O | | | | O | ✓ |
| tool (bench) | ✓ | | | | | | | | O | O | | ✓ | | ✓ | O | |
| Heater, strip | | | | | | | | | | | | | | | | |
| Lathe, CNC, c/w accessories | | | | | | | | | | | | | | ✓ | O | |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## *FABRICATION STUDIES*

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Materials and Structures
B. Fabrication Processes
C. Production Systems and Processes

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | B | B | B | B | B | C | C | C | A | A | B | B | B | B | B | B | B | B | C | C | C | C | C | B |
| INSTRUCTIONAL QUALIFICATIONS | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| INSTRUCTIONAL FACILITIES | • | • | • | • | • | • | • | • | • | • | | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| CREDENTIALLING OPPORTUNITIES | • | • | • | | • | • | | | | | • | • | • | • | • | • | | | | | | | | • | |
| **EQUIPMENT** | Basic Tools & Materials | Oxyacetylene Welding | Basic Electric Welding | Sheet Fabrication 1 | Fabrication Principles | Bar & Tubular Fabrication | Foundry 1 | Principles of Machining | Production Systems | Structural Engineering | Print Reading | Oxyfuel Welding | Thermal Cutting | Arc Welding 1 | Arc Welding 2 | Gas Metal Arc Welding 1 | Sheet Fabrication 2 | Sheet Fabrication 3 | Forging Fundamentals | Foundry 2 | Precision Turning 1 | Precision Milling 1 | CNC Turning | Custom Fabrication | Pipe Fitting |
| | CON | 1040 | 1050 | 1090 | 1100 | 1110 | 1120 | 1130 | 1160 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 |
| Lathe, metal c/w accessories | | | | | O | | O | ✓ | O | | | | | | | | | | | O | ✓ | O | | O | |
| Mill, CNC, c/w accessories | | | | | | | | O | O | | | | | | | | | | | | | | | O | |
| Mill, vertical c/w accessories | | | | | O | | ✓ | O | O | | | | | | | | | | | O | O | ✓ | | O | |
| Notcher | | | | O | O | | | | O | | | | | | | | ✓ | ✓ | | | | | | O | |
| Roll, slip | ✓ | | | ✓ | O | | | | O | | | | | | | | ✓ | ✓ | | | | | | O | |
| Rotary, machine and rollers | | | | O | | | | | | | | | | | | | | | | | | | | O | |
| Saw, band, comb. horizontal/vertical | | ✓ | | | O | O | | O | O | | | O | | O | O | O | | | ✓ | O | ✓ | ✓ | O | O | O |
| cut-off, abrasive | | | | | O | O | | O | O | | | O | | O | O | O | | | O | O | | | | O | O |
| Shear, beverly | | ✓ | ✓ | | O | | | | O | | | O | O | O | O | O | | | | | | | | O | |
| electric (portable) | | | | O | O | | | | | | | | | | | | O | O | | | | | | O | |
| squaring | ✓ | | | ✓ | O | | | | O | | | | | | | | ✓ | ✓ | | | | | | O | |
| Stakes c/w universal holder | O | | | ✓ | O | | | | O | | | | | | | | ✓ | ✓ | | | | | | O | |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## *FABRICATION STUDIES*

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Materials and Structures
B. Fabrication Processes
C. Production Systems and Processes

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | B | B | B | B | B | B | B | B | C | C | C | C | C | B |
| INSTRUCTIONAL QUALIFICATIONS | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | * | * | * | * | * | * | | | | | | | | * | * |
| EQUIPMENT | Materials Testing | Metallurgy Fundamentals | Gas Tungsten Arc Welding | Specialized Welding | Arc Welding 3 | Arc Welding 4 | Pipe & Tubular Welding | Automated Welding | Sheet Fabrication 4 | Sheet Fabrication 5 | Foundry 3 | Precision Turning 2 | Precision Milling 2 | CNC Milling | Prefabrication Principles | Gas Metal Arc Welding 2 |
| | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 |
| Lathe, metal c/w accessories | | | | | | | | | | | ○ | ✓ | | | ○ | |
| Mill, CNC, c/w accessories | | | | | | | | | | | | | ○ | ✓ | ○ | |
| Mill, vertical c/w accessories | | | | | | | | | | | ○ | ○ | ✓ | | ○ | |
| Notcher | | | | | | | | | ○ | ○ | | | | | ○ | |
| Roll, slip | | | | | | | | | ✓ | ✓ | | | | | ○ | |
| Rotary, machine and rollers | | | | | | | | | ✓ | ○ | | | | | ○ | |
| Saw, band, comb. horizontal/vertical | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | ○ | ○ | ○ | ○ | ○ | ○ |
| cut-off, abrasive | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | ○ | ○ | ○ | ○ | ○ | ○ |
| Shear, bevelly | ○ | | ○ | ○ | ○ | ○ | | ○ | | | | | | | ○ | ○ |
| electric (portable) | | | | | | | | | | | | | | | ○ | |
| squaring | | | | | | | | | ✓ | ✓ | | | | | ○ | |
| Stakes c/w universal holder | | | | | | | | | ✓ | ✓ | | | | | ○ | |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Materials and Structures
B. Fabrication Processes
C. Production Systems and Processes

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | B | B | B | B | B | C | C | C | A | A | B | B | B | B | B | B | B | B | C | C | C | C | C | B |
| INSTRUCTIONAL QUALIFICATIONS | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| INSTRUCTIONAL FACILITIES | • | • | • | • | • | • | • | • | • | • | | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| CREDENTIALLING OPPORTUNITIES | • | • | • | | • | • | | | | | • | • | • | • | • | • | | | | | | | | • | |
| **EQUIPMENT** | Basic Tools & Materials | Oxyacetylene Welding | Basic Electric Welding | Sheet Fabrication 1 | Fabrication Principles | Bar & Tubular Fabrication | Foundry 1 | Principles of Machining | Production Systems | Structural Engineering | Print Reading | Oxyfuel Welding | Thermal Cutting | Arc Welding 1 | Arc Welding 2 | Gas Metal Arc Welding 1 | Sheet Fabrication 2 | Sheet Fabrication 3 | Forging Fundamentals | Foundry 2 | Precision Turning 1 | Precision Milling 1 | CNC Turning | Custom Fabrication | Pipe Fitting |
| | CON | 1040 | 1050 | 1090 | 1100 | 1110 | 1120 | 1130 | 1160 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 |
| Table, forming | ✓ | | | ✓ | O | ✓ | | | O | | | | | | | | ✓ | ✓ | | | | | | O | |
| layout | O | | | ✓ | O | ✓ | | | ✓ | O | O | | | | | | ✓ | ✓ | | | | | | O | |
| welding | | ✓ | ✓ | | O | ✓ | | | O | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | O | |
| Tap and die set (NC/NF, met/imp) | O | | | | ✓ | ✓ | O | ✓ | O | O | | | | | | | | | O | | ✓ | ✓ | ✓ | O | |
| Threader, pipe | | | | | O | | | | | | | | | | | | | | | | | | | O | ✓ |
| Vise, machinist | ✓ | ✓ | O | ✓ | ✓ | ✓ | ✓ | ✓ | O | O | | O | O | O | O | O | O | O | ✓ | O | ✓ | ✓ | ✓ | O | ✓ |
| Welder, GMAW c/w accessories | | | ✓ | | O | O | | | O | | | | | | | ✓ | O | O | | | | | | O | |
| GTAW c/w accessories | | | | | | | | | | | | | | | | | | | | | | | | | |
| OAW c/w accessories | | ✓ | | | O | O | | | O | | | ✓ | ✓ | | | | | | O | | | | | O | |
| SMAW c/w accessories | | ✓ | O | | | O | | | O | | | | | ✓ | ✓ | | | | | | | | | O | |
| spot | O | O | ✓ | O | O | | | | O | | | | | | | | O | O | | | | | | O | |

*** Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.**

## Course Parameters

## *FABRICATION STUDIES*

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Materials and Structures
B. Fabrication Processes
C. Production Systems and Processes

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | B | B | B | B | B | B | B | B | C | C | C | C | C | B |
| INSTRUCTIONAL QUALIFICATIONS | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | * | * | * | * | * | * | | | | | | | | * | * |
| **EQUIPMENT** | Materials Testing | Metallurgy Fundamentals | Gas Tungsten Arc Welding | Specialized Welding | Arc Welding 3 | Arc Welding 4 | Pipe & Tubular Welding | Automated Welding | Sheet Fabrication 4 | Sheet Fabrication 5 | Foundry 3 | Precision Turning 2 | Precision Milling 2 | CNC Milling | Prefabrication Principles | Gas Metal Arc Welding 2 |
| | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 |
| Table, forming | | | | | | | | | ✓ | ✓ | | | | | | |
| layout | | | | | | | | | ✓ | ✓ | | | | | O | |
| welding | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | O | ✓ |
| Tap and die set (NC/NF, met/imp) | | | | | | | | | | | | ✓ | | ✓ | | |
| Threader, pipe | | | | | | | | | | | | | | | O | |
| Vise, machinist | ✓ | | | | | | ✓ | | | | O | ✓ | ✓ | | O | O |
| Welder, GMAW c/w accessories | | | | O | | | O | | O | O | | | | | ✓ | ✓ |
| GTAW c/w accessories | | | ✓ | | | | | | | | | | | | | |
| OAW c/w accessories | | | | O | | | | | | | | | | | | |
| SMAW c/w accessories | | | | O | | | O | | | | | | | | | |
| spot | | | | | | | | | O | O | | | | | | |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters for Fashion Studies

### Facilities

Some courses in Fashion Studies can be delivered in a typical classroom setting. Refer to Attachment 4: CTS without Labs in this appendix. Others require access to more specialized facilities, such as:

- adequate electrical services to accommodate the number of sewing machines available
- adequate space for fabric/pattern layout and equipment available
- access to computers and appropriate software.

Also desirable, though not essential, are instructional facilities that have:

- water and a sink
- a changing/fitting room.

Courses that require access to facilities in addition to those present in a typical classroom setting are identified in the Course Parameters. For more information, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

### Equipment

A recommended equipment list is provided in the Course Parameters chart. Though not exhaustive, the list identifies equipment recommended as necessary to meet the course outcomes.

Equipment for courses in Fashion Studies can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers may find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each course.

### Safety and Security Considerations

Safety with respect to the use of equipment; i.e., sewing machines, scissors, iron, is important in the production theme. In addition, it is also important to monitor supplies and equipment and to have a means of security for student project storage.

### Instructional Qualifications

Responsibility for instructional planning and delivery of courses in Fashion Studies can be assumed by Alberta Certified Teachers having instructional expertise in the area of Home Economics—Clothing and Textiles, Design and/or Merchandising. A background in clothing construction, flat pattern and pattern drafting is an asset to those who provide instruction in Fashion Studies courses in the production theme. Computer expertise is an asset, particularly in offering the two *Computer-aided Design (CAD) Patterns* courses.

### Credentialling Opportunities

No credentialling opportunities have been identified for the Fashion Studies courses.

## Course Parameters

## *FASHION STUDIES*

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Production
B. Design
C. Merchandising

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | A | A | A | A | B | B | B | B | A | A | A | A | A | A |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | | | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | | |
| **EQUIPMENT** | Ready, Set, Sew! | Fashion Basics | Repair & Recycle | Creating Accessories 1 | Creative Yarns/Textiles | Fashion Dynamics | Fashion Illustration 1 | CAD Patterns 1 | Evolution of Fashion | Flat Pattern | Pattern Drafting 1 | Creative Construction | Activewear | Specialty Fabrics 1 | Sewing for Others |
| | 1030 | 1040 | 1050 | 1060 | 1070 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 |
| Cabinets/specialized tables | O | O | O | O | | | | | | O | O | O | O | O | O |
| Computer | O | O | O | O | O | O | O | ✓ | O | O | O | O | O | O | O |
| Iron and ironing board | ✓ | ✓ | ✓ | ✓ | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Printer/plotter | | | | | | | | ✓ | O | O | O | O | O | O | O |
| Serger | ✓ | ✓ | ✓ | ✓ | O | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Sewing machines | ✓ | ✓ | ✓ | ✓ | O | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | C | A | A | B | B | A | A | A | B | A | A | C |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | |
| INSTRUCTIONAL FACILITIES | * | * | | * | * | | * | * | * | * | | * | * | |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | |
| **EQUIPMENT** | Creating Home Decor | Surface Embellishment | Fashion Merchandising | Upholstery | Creating Accessories 2 | Fashion Illustration 2 | CAD Patterns 2 | Pattern Drafting 2 | Contemporary Tailoring | Couture | Creators of Fashion | Cultural Fashions | Specialty Fabrics 2 | Fashion Retailing |
| | 2110 | 2120 | 2140 | 2150 | 2160 | 3010 | 3020 | 3030 | 3040 | 3060 | 3070 | 3080 | 3090 | 3140 |
| Cabinets/specialized tables | O | O | | | | | | O | O | O | | O | O | |
| Computer | O | O | O | O | O | O | ✓ | O | O | O | O | O | O | O |
| Iron and ironing board | ✓ | O | | | | | | ✓ | ✓ | ✓ | | ✓ | O | |
| Printer/plotter | O | O | O | | | O | ✓ | O | O | O | O | O | O | O |
| Serger | ✓ | ✓ | | O | ✓ | | | ✓ | ✓ | ✓ | | ✓ | ✓ | |
| Sewing machines | ✓ | ✓ | | O | ✓ | | | ✓ | ✓ | ✓ | | ✓ | ✓ | |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters for Foods

### Facilities

CTS programs centred around Foods should include courses that link with facilities that are readily available in the school and/or community. All Foods courses require a personal or commercial food preparation facility. The type of facility required for the Foods strand is determined by the contextual application of the courses. Programs that focus on a personal application as the context for learning may be offered in a facility with equipment typically found in a household kitchen. However, programs that focus on a commercial application require access to a commercial facility and commercial equipment.

When selecting or planning a facility for Foods, ensure that there is:

- adequate space for instruction
- adequate services to run the equipment
- ample storage areas for equipment, tools and supplies
- dry and refrigerated storage
- adequate ventilation
- access to water and adequate plumbing services
- appropriate ambient features
- appropriate safety features.

Courses that require access to facilities in addition to those present in a typical classroom setting are identified in the Course Parameters. For more information, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

### Equipment

A recommended equipment list is provided in the Course Parameters chart. Though not exhaustive, the list identifies equipment recommended as necessary to meet the course outcomes. The equipment that is essential only in a commercial facility is identified with "C." The equipment required varies according to the contextual application of the courses. All other equipment included in the list is either recommended or optional in courses offered in either a personal or a commercial context.

Equipment for courses in Foods can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers may find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each course.

### Safety and Security Considerations

The maintenance of a safe and sanitary learning/working environment is everyone's concern in a facility supporting a Foods program. A number of safety issues exist:

- the layout of the laboratory
- the number of students in the laboratory setting
- laboratory management
- the maintenance and use of equipment and tools
- sanitary and hygienic food handling and storage
- personal hygienic practices
- federal, provincial and local food regulations.

In addition, it is also important to formulate a plan to monitor food inventory and supplies.

### Instructional Qualifications

Responsibility for instructional planning and delivery of courses in Foods can be assumed by Alberta Certified Teachers having instructional expertise in the area of Home Economics (Foods) and/or Food Preparation. If the course is offered in a commercial context, with the use of commercial equipment, journeyman status is strongly recommended. The course *Basic Meat Cutting* requires meat cutting experience and/or certification in meat cutting to teach.

Courses requiring additional instructor credentials are identified in the course parameters chart. For more information, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

### Credentialling Opportunities

Students may earn credentials recognized by business, industry and post-secondary institutions by demonstrating a specific set of competencies. Based on an articulation agreement established with the Apprenticeship and Industry Training Division, Alberta Advanced Education and Career Development, students who complete specified CTS courses may be eligible to obtain advanced standing in the apprenticeship program for Cook. Further details regarding each articulation agreement, including a correlation to CTS strands and courses, are provided in Appendix 5: Planning Ahead—CTS Transitions into Post-secondary Programs and the Workplace. Additional information can be obtained by contacting the Apprenticeship and Industry Training Division, Alberta Advanced Education and Career Development. A list of local Career Development Centres throughout Alberta is also provided in Appendix 5: Planning Ahead—CTS Transitions into Post-secondary Programs and the Workplace.

For more information related to certification opportunities that meet the requirements of Section 43 of the Public Health Act Food Regulation, see FOD2150: Food Safety & Sanitation in Section E of the *Guide to Standards and Implementation*.

## Course Parameters

### *FOODS*

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Nutrition
B. Preparation and Presentation
C. Management
D. Social and Cultural

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments
C Commercial Facility

| | Food Basics | Baking Basics | Snacks & Appetizers | Meal Planning 1 | Fast & Convenience Foods | Canadian Heritage Foods | Food & Nutrition Basics | Nutrition & the Athlete | Food Decisions & Health | Cake & Pastry | Yeast Breads & Rolls | Milk Products & Eggs | Stocks, Soups & Sauces | Vegetables/Fruits/Grains | Creative Cold Foods | Basic Meat Cookery | Fish & Poultry | Meal Planning 2 | Vegetarian Cuisine | Rush Hour Cuisine | Food Safety & Sanitation | Food Venture | International Cuisine 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | B | B | C | C | D | A | A | A | B | B | B | B | B | B | B | B | C | C | C | C | C | D |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| INSTRUCTIONAL FACILITY | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | * | * | | | * | * | * | | | * | * | * | * | * | * | * | * | | * | | * | | * |
| **EQUIPMENT** | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 |
| Baker's table | | O | | | | | | | | O | C | | | | | | | | | | | | |
| Bun divider | | | | | | | | | | | C | | | | | | | | | | | | |
| Cabinet, proofer hot and cold | | O | | | | | | | | | C | | | | | | | | | | | | |
| Computer | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
| Cookware | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Deep fat fryer | | | | | | | | | | | | | C | C | | C | C | | | | | | |
| Dehydrator | | | | | | | | | | | | | | | | | | | | | | | |
| Demonstration table | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
| Dinnerware | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Flatware | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Grill Top | | | | | | | | | | | | C | C | C | | C | C | | | | | | |

*** Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.**

## Course Parameters

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Nutrition
B. Preparation and Presentation
C. Management
D. Social and Cultural

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments
C Commercial Facility

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | B | B | B | B | B | B | B | C | C | C | C | D |
| INSTRUCTIONAL QUALIFICATIONS | | | * | * | * | * | * | * | * | * | * | * | * | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | * | * | * | * | * | * | * | * | * | | | * |
| **EQUIPMENT** | Food for the Life Cycle | Nutrition & Digestion | Creative Baking | Advanced Yeast Products | Advanced Soups & Sauces | Food Presentation | Short Order Cooking | Advanced Meat Cookery | Basic Meat Cutting | Entertaining with Food | Food Processing | Food Evolution/Innovation | The Food Entrepreneur | International Cuisine 2 |
| | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 |
| Baker's table | | | C | C | | | | | | | | | | |
| Bun divider | | | | | | | | | | | | | | |
| Cabinet, proofer hot and cold | | | | C | | | | | | | | | | |
| Computer | O | O | O | O | O | O | O | O | | O | O | O | O | O |
| Cookware | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Deep fat fryer | | | | | | | ✓ | O | | | | | | |
| Dehydrator | | | | | | | | | | | O | | | |
| Demonstration table | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
| Dinnerware | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Flatware | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Grill Top | | | | | | | ✓ | C | | | | | | |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Nutrition
B. Preparation and Presentation
C. Management
D. Social and Cultural

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments
C Commercial Facility

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | B | B | C | C | D | A | A | A | B | B | B | B | B | B | B | B | C | C | C | C | C | D |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| INSTRUCTIONAL FACILITY | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | * | * | | | * | * | * | | | * | * | * | * | * | * | * | * | | * | | * | | * |
| **EQUIPMENT** | Food Basics | Baking Basics | Snacks & Appetizers | Meal Planning 1 | Fast & Convenience Foods | Canadian Heritage Foods | Food & Nutrition Basics | Nutrition & the Athlete | Food Decisions & Health | Cake & Pastry | Yeast Breads & Rolls | Milk Products & Eggs | Stocks, Soups & Sauces | Vegetables/Fruits/Grains | Creative Cold Foods | Basic Meat Cookery | Fish & Poultry | Meal Planning 2 | Vegetarian Cuisine | Rush Hour Cuisine | Food Safety & Sanitation | Food Venture | International Cuisine 1 |
| | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 |
| Ice maker | | | | | | | | | | | | | | | C | | | | | | | | |
| Knife set | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Meat bandsaw | | | | | | | | | | | | | | | | | | | | | | | |
| block | | | | | | | | | | | | | | | | O | | | | | | | |
| grinder | | | | | | | | | | | | | | | | | | | | | | | |
| hook racks | | | | | | | | | | | | | | | | | | | | | | | |
| slicer | | | | | | | | | | | | | | | C | | | | | | | | |
| Mixer, commercial size | | O | | | | | | | | C | C | | | | C | | | | | | | | |
| Mobile utility cart | | | | | | | | | | O | C | O | C | O | O | C | O | | | | | C | |
| Pot storage racks | | | | | | | | | | | | | O | O | | O | O | | | | | | |
| Range/oven/microwave | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## *FOODS*

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Nutrition
B. Preparation and Presentation
C. Management
D. Social and Cultural

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments
C Commercial Facility

| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | A | B | B | B | B | B | B | B | C | C | C | C | D |
| INSTRUCTIONAL QUALIFICATIONS | | | * | * | * | * | * | * | * | * | * | * | * | * |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | * | * | * | * | * | * | * | * | * | | | * |
| **EQUIPMENT** | Food for the Life Cycle | Nutrition & Digestion | Creative Baking | Advanced Yeast Products | Advanced Soups & Sauces | Food Presentation | Short Order Cooking | Advanced Meat Cookery | Basic Meat Cutting | Entertaining with Food | Food Processing | Food Evolution/Innovation | The Food Entrepreneur | International Cuisine 2 |
| | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 |
| Ice maker | | | | | | | | | | | | | | |
| Knife set | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Meat bandsaw | | | | | | | | | ✓ | | | | | |
| block | | | | | | | | C | ✓ | | | | | |
| grinder | | | | | | | | | ✓ | | | | | |
| hook racks | | | | | | | | | ✓ | | | | | |
| slicer | | | | | | | ✓ | | ✓ | | | | | |
| Mixer, commercial size | | | | | | | | | | | | | | |
| Mobile utility cart | | | C | C | C | C | C | C | | | | | | |
| Pot storage racks | | | O | O | O | | O | O | | | | | | |
| Range/oven/microwave | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## *FOODS*

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Nutrition
B. Preparation and Presentation
C. Management
D. Social and Cultural

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments
C Commercial Facility

| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | B | B | C | C | D | A | A | A | B | B | B | B | B | B | B | B | C | C | C | C | C | D |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| INSTRUCTIONAL FACILITY | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | * | * | | | * | * | * | | * | * | * | * | * | * | * | * | * | | * | | * | | * |
| **EQUIPMENT** | Food Basics | Baking Basics | Snacks & Appetizers | Meal Planning 1 | Fast & Convenience Foods | Canadian Heritage Foods | Food & Nutrition Basics | Nutrition & the Athlete | Food Decisions & Health | Cake & Pastry | Yeast Breads & Rolls | Milk Products & Eggs | Stocks, Soups & Sauces | Vegetables/Fruits/Grains | Creative Cold Foods | Basic Meat Cookery | Fish & Poultry | Meal Planning 2 | Vegetarian Cuisine | Rush Hour Cuisine | Food Safety & Sanitation | Food Venture | International Cuisine 1 |
| | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 |
| Refrigeration, cart shelf units | | | | | | | | | O | O | O | O | O | O | O | O | O | | | | | | |
| Refrigerator/freezer | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Scale, portion | | | | | | | | | | C | C | | C | C | C | C | | | | | | | |
| Small electric appliances | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Steam cooker | | | | | | | | | | | | | | C | | | | | | | | | |
| kettle | | | | | | | | | | | | C | C | C | | | | | | | | | |
| Vegetable cooker | | | | | | | | | | | | | | O | | | | | | | | | |
| Washer/dryer | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Work table/counter | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Nutrition
B. Preparation and Presentation
C. Management
D. Social and Cultural

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments
C Commercial Facility

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | B | B | B | B | B | B | B | C | C | C | C | D |
| INSTRUCTIONAL QUALIFICATIONS | | | • | • | • | • | • | • | • | • | • | • | • | • |
| INSTRUCTIONAL FACILITIES | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| CREDENTIALLING OPPORTUNITIES | | | • | • | • | • | • | • | • | • | • | | | • |
| **EQUIPMENT** | Food for the Life Cycle | Nutrition & Digestion | Creative Baking | Advanced Yeast Products | Advanced Soups & Sauces | Food Presentation | Short Order Cooking | Advanced Meat Cookery | Basic Meat Cutting | Entertaining with Food | Food Processing | Food Evolution/Innovation | The Food Entrepreneur | International Cuisine 2 |
| | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 |
| Refrigeration, cart shelf units | | | O | O | O | O | O | O | O | O | O | O | O | O |
| Refrigerator/freezer | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Scale, portion | | | C | C | C | | | C | | | | | | |
| Small electric appliances | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Steam cooker | | | | | | | | | | | ✓ | | | |
| kettle | | | | | C | | | | | | | | | |
| Vegetable cooker | | | | | O | | O | O | | | O | | | |
| Washer/dryer | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Work table/counter | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters for Forestry

### Facilities

Some courses in the Forestry scope and sequence can be delivered in a typical classroom setting. Refer to Attachment 4: CTS without Labs in this appendix. Others require access to more specialized in-school and off-campus facilities, such as:

- woodlots and/or demonstration forests
- science, design, construction, fabrication and mechanics laboratories
- observation and training sites sponsored by relevant industry, government and/or post-secondary agencies
- resource centres equipped with computer hardware/software and audio-visual material.

Also desirable, though not essential, are instructional facilities that have:

- water and sinks
- display and storage areas for specimens and artifacts
- whiteboards/bulletin boards
- fresh air and fume extraction
- lighting capabilities conducive to horticulture
- an exterior exit
- telephone service.

Courses that require access to facilities in addition to those present in a typical classroom setting are identified in the Course Parameters. For more information, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

### Equipment

An equipment list is provided in the Course Parameters chart. Though not exhaustive, the list identifies recommended and optional equipment for meeting the course outcomes.

Equipment for courses in Forestry can be obtained through a combination of purchasing, borrowing, renting improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers may find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each course.

### Safety Considerations

Facilities used to support a Forestry program must ensure a safe learning/working environment. Students must be aware of federal, provincial and local regulations governing the tasks they perform, and adhere to appropriate personal and environmental health and safety procedures in courses that involve:

- the use of specialized hand/power equipment
- the handling and storage of hazardous materials
- outdoor trips and field-based investigations.

Students must understand immediate and potential hazards associated with the tasks they perform, and the possible impact of these hazards on self, others and the environment.

**Instructional Qualifications**

Courses in Forestry can be implemented by Alberta Certified Teachers who have an interest in providing instruction in classroom, laboratory and/or outdoor environments. A background in science and/or forest industry is an asset to those who provide instruction in Forestry courses, particularly at the intermediate and advanced levels. Teachers may find it desirable to access sources of instructional support available from forest industry, professional forestry associations and consultants, and relevant government agencies; e.g., Alberta Environmental Protection.

To ensure compliance with safety and industrial standards, some courses require that components of instruction be provided by a person(s) having additional credentials granted by business, industry, government or community organizations. Forestry courses requiring additional instructor credentials are identified in the Course Parameters chart. For more information, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

**Credentialling Opportunities**

Some courses within the Forestry strand provide opportunities for students to earn credentials recognized by business, industry and/or post-secondary institutions. Courses that link with credentialling opportunities relevant to the forestry sector are identified in the course parameters chart. For more information regarding the credential, requirement/qualification and credentialling agency, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

## Course Parameters

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Social and Cultural Perspectives
B. Technology and Applications
C. Management and Conservation

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| EQUIPMENT | Why Forestry? 1010 | Forest Regions of Canada 1020 | Woods Survival 1 1040 | Mapping & Aerial Photos 1050 | Measuring the Forest 1 1060 | Forest Ecology 1 1080 | Forests Forever 1 1100 | Making a Difference 2010 | Managing Alberta Forests 2030 | Woods Survival 2 2040 | Measuring the Forest 2 2060 | Harvest Practices 2070 | Forests Forever 2 2100 | Users in the Forest 2120 | Issues in Forestry 3010 | Measuring the Forest 3 3060 | The Forest Marketplace 3070 | Forest Technology Applications 3080 | Forest Ecology 2 3090 | Silviculture 3110 | Integrated Resource Management 3120 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | A | B | B | C | C | A | A | A | B | B | C | C | A | B | B | B | C | C | C |
| INSTRUCTIONAL QUALIFICATIONS | | | * | | | | | | | * | | | | | | | | | | | |
| INSTRUCTIONAL FACILITIES | | | * | * | * | * | | | | * | * | | | | | | | | * | * | |
| CREDENTIALLING OPPORTUNITIES | | | * | | | | | | | * | | | | | | | | | | | |
| Binoculars | | | ○ | | ○ | | | | | ○ | ○ | | | | | | | | | | |
| Calculator | | | | ✓ | ✓ | ○ | | ○ | | ○ | ✓ | | | ○ | | ✓ | | | ○ | | ✓ |
| Camcorder | | | | | | | ○ | ○ | | | | ○ | | | | | | ○ | ○ | | |
| Camera | | | ○ | | ○ | | ○ | ○ | | ○ | ○ | ○ | | | | | | ○ | ○ | | |
| Camping gear (1) | | | ✓ | | | | | | | ✓ | | | | | | | | | | | |
| Canoe | | | ○ | | | | | | | ○ | | | | | | | | | | | |
| Chainsaw | | | | | | | | | | ○ | | ○ | | | | | | | | | |
| Clinometer | | | | | ✓ | | | | | | ✓ | | | | | | | | ○ | | |
| Compass | | | ✓ | ✓ | ✓ | | | | | ✓ | | | | | | ○ | | | ○ | | |
| Computers and software | | | | | | | ○ | ○ | | | | | | | | ○ | | | | | |
| Container trays | | | | | | | | | | | | | | | | | | | | ✓ | |
| Douglas protractor | | | | ✓ | | | | | | | | | | ○ | | ○ | | | | | ○ |
| First aid supplies | | | ✓ | | ✓ | ✓ | | | | ✓ | ✓ | | | | | | | ○ | ✓ | | |

(1) Camping gear includes tent, campstove, sleeping bag, cooking utensils, lantern, knife, sanitary supplies, personal grooming items.

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## *FORESTRY*

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Social and Cultural Perspectives
B. Technology and Applications
C. Management and Conservation

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | A | B | B | C | C | A | A | A | B | B | C | C | A | B | B | B | C | C | C |
| INSTRUCTIONAL QUALIFICATIONS | | | • | | | | | | | • | | | | | | | | | | | |
| INSTRUCTIONAL FACILITIES | | | • | • | • | • | | | | • | • | | | | | | | | • | • | |
| CREDENTIALLING OPPORTUNITIES | | | • | | | | | | | • | | | | | | | | | | | |
| **EQUIPMENT** | Why Forestry? | Forest Regions of Canada | Woods Survival 1 | Mapping & Aerial Photos | Measuring the Forest 1 | Forest Ecology 1 | Forests Forever 1 | Making a Difference | Managing Alberta Forests | Woods Survival 2 | Measuring the Forest 2 | Harvest Practices | Forests Forever 2 | Users in the Forest | Issues in Forestry | Measuring the Forest 3 | The Forest Marketplace | Forest Technology Applications | Forest Ecology 2 | Silviculture | Integrated Resource Management |
| | 1010 | 1020 | 1040 | 1050 | 1060 | 1090 | 1100 | 2010 | 2030 | 2040 | 2060 | 2070 | 2100 | 2120 | 3010 | 3060 | 3070 | 3080 | 3090 | 3110 | 3120 |
| Increment borer | | | | | ✓ | | | | | | | | | | | | | | | | |
| Kit, soil testing | | | | | | | | | | | | | | | | | | | ✓ | | |
| Maps, forestry (2) | | ○ | ✓ | ✓ | | | | | | ✓ | | | | ✓ | | ✓ | | | ○ | | |
| Outdoor gear (3) | | ✓ | ✓ | | ✓ | | | | | ✓ | | | | | | | | ○ | ✓ | ✓ | |
| Personal safety equipment (4) | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ | ✓ | | | | | | ○ | ✓ | ✓ | |
| Photos, aerial | | | ✓ | ✓ | | | | | | ✓ | | | | ○ | | ✓ | | | ○ | | |
| Planting bags/pails | | | | | | | | | | | ✓ | | | | | | | | | ✓ | |
| tools (5) | | | | | | | | | | | | | | | | | | | | ○ | |
| Polychord chain | | | | | ✓ | | | | | | | | | | | | | | ○ | | |

(2) Maps include forest cover, forest stand, topographic, forest regions, administrative boundaries, green and white areas.
(3) Outdoor gear includes bush clothing, backpack, outdoor boots and rain gear, as required.
(4) Personal safety items include hard hat, safety glasses, ear protectors, pressure and triangular bandages, as required.
(5) Planting tools include mattock and planting shovel.

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## FORESTRY

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Social and Cultural Perspectives
B. Technology and Applications
C. Management and Conservation

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | A | A | B | B | C | C | A | A | A | B | B | C | C | A | B | B | B | C | C | C |
| INSTRUCTIONAL QUALIFICATIONS | | | * | | | | | | | * | | | | | | | | | | | |
| INSTRUCTIONAL FACILITIES | | | * | * | * | * | | | | * | * | | | | | | | | * | * | |
| CREDENTIALLING OPPORTUNITIES | | | * | | | | | | | * | | | | | | | | | | | |
| **EQUIPMENT** | Why Forestry? | Forest Regions of Canada | Woods Survival 1 | Mapping & Aerial Photos | Measuring the Forest 1 | Forest Ecology 1 | Forests Forever 1 | Making a Difference | Managing Alberta Forests | Woods Survival 2 | Measuring the Forest 2 | Harvest Practices | Forests Forever 2 | Users in the Forest | Issues in Forestry | Measuring the Forest 3 | The Forest Marketplace | Forest Technology Applications | Forest Ecology 2 | Silviculture | Integrated Resource Management |
| | 1010 | 1020 | 1040 | 1050 | 1060 | 1090 | 1100 | 2010 | 2030 | 2040 | 2060 | 2070 | 2100 | 2120 | 3010 | 3060 | 3070 | 3080 | 3090 | 3110 | 3120 |
| Pruning tools | | | | | | | | | | | | | | | | | | | | ✓ | |
| Riker (permanent display) mounts | | O | | ✓ | | ✓ | O | | | | | | ✓ | | | | | | O | | |
| Saw | | | ✓ | | | | | | | ✓ | | | | | | | | | | | |
| Seedlings, bare root and container grown | | | | | | | | | | | | | | | | | | | | ✓ | |
| Shovel | | | | | | | | | | | | | | | | | | | ✓ | ✓ | |
| Slides/specimens, tree (6) | | ✓ | | ✓ | | | O | | | | | | ✓ | | | | | | ✓ | | |
| Snowshoes | | | O | | | | | | | O | | | | | | | | | | | |
| Stereoscope | | | | ✓ | | | | | | | | | | O | | O | | | | | |
| Table, drafting | | | | O | | | | | | | | | | | | O | | | | | |
| Tape, 30m | | | | | ✓ | | | | | | ✓ | | | | | | | | ✓ | | |
| diameter | | | | | ✓ | | | | | | ✓ | | | | | | | | | | |
| flagging | | | | | ✓ | | | | | | | | | | | | | | ✓ | | |
| Cross-country skis | | | O | | | | | | | O | | | | | | | | | | | |

(6) Specimens may include forest disease, forest insect, wood products, cones, seeds and other tree parts.

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters for Information Processing

### Facilities

CTS programs centred around Information Processing should include courses that link with facilities that are readily available in the school and the community. When selecting or planning a facility for Information Processing, ensure:

- adequate space for instruction
- adequate services to run the equipment
- hardware and software appropriate for program, especially for courses selected at the advanced level
- a resource centre that includes storage for print and audio-visual materials.

Courses that require access to facilities in addition to those present in a typical classroom setting are identified in the Course Parameters. For more information, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

### Equipment

A recommended equipment list is provided in the Course Parameters chart. Though not exhaustive, the list identifies equipment recommended as necessary to meet the course outcomes. Specific makes and models of equipment are to be determined at the local level.

Equipment for courses in Information Processing can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers may find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each course.

### Instructional Qualifications

Responsibility for instructional planning and delivery of courses in Information Processing can be assumed by Alberta Certified Teachers having instructional expertise in classroom and laboratory environments. Business and industry training or experience is an asset in delivering Information Processing courses, particularly at the intermediate and advanced levels. Teachers may find it desirable to form partnerships with local businesses.

### Credentialling Opportunities

No credentialling opportunities have been identified for the Information Processing courses.

**Course Parameters** **INFORMATION PROCESSING**

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. System Operations
B. Text/Data Input
C. Productivity Software
D. Applied Processing
E. Dynamic Environment
F. Programming

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| | Computer Operations | Keyboarding 1 | Word Processing 1 | Graphics Tools | Database 1 | Spreadsheet 1 | Hypermedia Tools | Programming 1 | Information Highway 1 | Workstation Operations | Keyboarding 2 | Keyboarding 3 | Word Processing 2 | Electronic Publishing 1 | Database 2 | Spreadsheet 2 | Correspondence | Reports | Tables/Forms | Software Integration 1 | Multimedia Authoring 1 | Process Control | Programming 2 | Programming 3 | Programming 4 | Programming 5 | Telecommunications 1 | Information Highway 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | B | C | C | C | C | E | F | E | A | B | B | C | C | C | C | D | D | D | D | E | E | F | F | F | F | A | E |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **EQUIPMENT** | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 1070 | 1080 | 1090 | 2010 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 | 2180 | 2190 | 2200 |
| CDROMs | O | | | | | | | | | O | | | | | | | | | | | | | | | | | | |
| Computer station CPU keyboard monitors, related software, ratio 1:1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Computer station furniture (table, chair, copy stand) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Internet access | | | | | | | | | ✓ | O | | | | | | | | | | | O | | | | | | ✓ | ✓ |
| Laptops | | | | | | | | | | O | | | | | | | | | | | | | | | | | | |
| Network capability | | | | | | | | | ✓ | O | | | | | | | | | | | O | O | | | | | | |
| Printer | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Scanner | | | | | | | | | | O | | | | | | | | | | | O | | | | | | | |
| Voice input capabilities | | | | | | | | | | O | | | | | | | | | | | O | | | | | | O | O |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## INFORMATION PROCESSING

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. System Operations
B. Text/Data Input
C. Productivity Software
D. Applied Processing
E. Dynamic Environment
F. Programming

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | B | B | B | C | C | C | D | D | D | D | E | E | F | F | F | A | E | E |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | | | | | | |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | | | | | | | |
| **EQUIPMENT** | Hardware/Software Analysis | Local Area Networks | Keyboarding 4 | Keyboarding 5 | Keyboarding 6 | Word Processing 3 | Electronic Publishing 2 | Information Management Tools | Software Integration 3 | Specialization 1 | Specialization 2 | Software Integration 2 | Multimedia Authoring 2 | Expert Systems | Programming Application 1 | Programming Application 2 | Programming Application 3 | Telecommunications 2 | Information Highway 3 | Internet Services |
| | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 | 3180 | 3190 | 3200 |
| CDROMs | O | O | | | | | | | | | | | | | | | | | | |
| Computer station CPU keyboard monitors, related software, ratio 1:1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Computer station furniture (table, chair, copy stand) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Internet access | O | O | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ |
| Laptops | O | O | | | | | | | | | | | | | | | | | | |
| Network capability | | ✓ | | | | | | | | | | O | O | O | | | O | ✓ | ✓ | ✓ |
| Printer | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Scanner | O | O | | | | ✓ | O | | | | | | O | O | | | | | | |
| Voice input capabilities | O | O | | | | | | | | | | | O | | | | | | | |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters for Logistics

### Facilities

CTS programs centred around Logistics should include courses that link with facilities that are readily available in the school and the community. When planning facilities for a Logistics course, decisions regarding the following should be given consideration:

- use of the school authority's or schools' warehousing, shipping and receiving areas for many of the learnings within the warehousing and distribution courses
- access to computers, and database and spreadsheet programs
- use of existing in-school laboratories and/or equipment; e.g., information processing, management and marketing
- local businesses and institutions that can provide off-campus learning opportunities
- a resource centre that includes computer hardware/software, as well as storage for print and audio-visual material.

All Logistics courses, with the exception of LOG1010: Logistics, require access to facilities not generally present in a typical classroom setting or school. For these courses, it is recommended that students be placed in a variety of off-campus logistics operations. For more information for the specific type of logistics operation, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation.*

### Equipment

Given that it is recommended that all but one of the Logistics courses be delivered off-campus, and that the equipment and technology used in logistics operations is constantly changing, no equipment, with the exception of computer equipment, is identified in the Course Parameters chart.

Teachers may find it desirable to identify the types of equipment used in local logistics operations and, where appropriate, access similar equipment for use by students in the school or gain use of the equipment in the community.

### Instructional Qualifications

Responsibility for instructional planning and delivery of courses in Logistics can be assumed by Alberta Certified Teachers having instructional expertise in classroom and laboratory environments. Business training or experience in one or more aspects of logistics is an asset in delivering or facilitating the delivery of Logistics courses. The development of partnerships with local businesses and institutions having logistics operations is critical to the effective delivery of the Logistics courses.

Additional instructor credentials are not required in order to deliver or facilitate the delivery of the Logistics courses. However, the requirement to access people with specialized knowledge and skills is identified in the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation.*

### Credentialling Opportunities

No credentialling opportunities have been identified for the Logistics courses.

## Course Parameters

## *LOGISTICS*

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Introduction to Logistics
B. Warehousing and Distribution
C. Traffic and Transportation
D. Purchasing
E. Inventory Management and Control

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 |
| THEME | A | B | C | D | B | C | D | E | B | C | D | E |
| INSTRUCTIONAL QUALIFICATIONS | | * | * | * | * | * | * | * | * | * | * | * |
| INSTRUCTIONAL FACILITIES | | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | |
| **EQUIPMENT** | Logistics | Warehouse & Distribute 1 | Traffic & Transport 1 | Purchasing 1 | Warehouse & Distribute 2 | Traffic & Transport 2 | Purchasing 2 | Inventory Management 1 | Warehouse & Distribute 3 | Traffic & Transport 3 | Purchasing 3 | Inventory Management 2 |
| | 1010 | 1020 | 1030 | 1040 | 2010 | 2020 | 2030 | 2040 | 3010 | 3020 | 3030 | 3040 |
| Computer(s) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Internet access | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters for Management and Marketing

### Facilities

CTS programs centred around Management and Marketing should include courses that link with facilities readily available in the school and the community. When planning facilities for a Management and Marketing course, the following should be given consideration:

- use of school store as a lab for many of the learnings within the Marketing Systems and Strategies theme
- installation of a three-basin sink if serving food in a school store
- access to telephones for purchasing and ordering merchandise
- use of existing in-school laboratories and/or equipment; e.g., information processing, construction, design, fabrication and communications
- use of computer technology within the classroom for all courses, but in particular the promotional courses and the communication strategies courses
- identification of in-school window displays for visual merchandising or construction of shadow boxes for use in classroom
- linkages to the business community to deliver content
- storage area for inventory, props and supplies
- a resource centre that includes computer hardware/software, as well as storage for print and audio-visual material.

Courses that require access to facilities in addition to those present in a typical classroom setting are identified in the Course Parameters. For more information, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

### Equipment

A recommended equipment list is provided in the Course Parameters chart. Though not exhaustive, the list identifies equipment recommended as necessary to meet the course outcomes. Note that a school store is not required for a Management and Marketing program; thus equipment for a school store is listed as optional. Specific makes and models of equipment are to be determined at the local level.

Equipment for courses in Management and Marketing can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers may find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each course.

### Instructional Qualifications

Responsibility for instructional planning and delivery of courses in Management and Marketing may be assumed by Alberta Certified Teachers having instructional expertise in classroom and laboratory environments. Business training or experience is an asset in delivering Management and Marketing courses, particularly at the intermediate and advanced levels. Teachers may find it desirable to form partnerships with local businesses.

### Credentialling Opportunities

No credentialling opportunities have been identified for the Management and Marketing courses.

## Course Parameters

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Business Management Systems and Strategies
B. Marketing Systems and Strategies
C. Information Management Systems and Strategies

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments
C Commercial Facility – School Store

| LEVEL | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | B | B | C | A | B | B | B | C | C | C | A | A | A | B | B | B | C | C | C |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | | | | | |
| INSTRUCTIONAL FACILITIES | | | * | | | | | * | * | | | | | | | | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | | | | | | |
| **EQUIPMENT** | Management & Marketing Basics | Quality Customer Service | Communication Strategies 1 | Managing for Quality | Promotion: Advertising | Promotion: Visual Merchandising | Retail Operations | Office Systems 1 | Communication Strategies 2 | Records Management 1 | The Business Organization | Business in the Canadian Economy | Business in the Global Marketplace | Promotion: Sales Techniques | Distributing Goods & Services | Setting Up a Retail Store | Office Systems 2 | Communication Strategies 3 | Records Management 2 |
| | 1010 | 1020 | 1030 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2080 | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 |
| 3-basin sink (if serving food) | | ✓ | | | | | | | | | | | | | | | | | |
| Cash register | | C | | | | | | | | | | | | O | | | | | |
| Computer/printer | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Computerized inventory tracking | | O | | | | | O | | | | | | | | | | | | |
| Counter | | C | | | | O | | | | | | | | O | | | | | |
| Display area | | | | | | | | | | | | | | | | | | | |
| windows | | O | | | | O | | | | | | | | O | | | | | |
| shelves | | O | | | | O | | | | | | | | O | | | | | |
| Dressing room | | O | | | | | | | | | | | | O | | | | | |
| Electronic calculator | | O | | | | | ✓ | | | | | | | | | | | | |
| signboard | | O | | | O | O | | | | | | | | O | | | | | |
| Filing cabinet | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Business Management Systems and Strategies
B. Marketing Systems and Strategies
C. Information Management Systems and Strategies

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| LEVEL | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | B | B | C | A | B | B | B | C | C | C | A | A | A | B | B | B | C | C | C |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | | | | | |
| INSTRUCTIONAL FACILITIES | | | * | | | | | * | * | | | | | | | | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | | | | | | |
| **EQUIPMENT** | Management & Marketing Basics | Quality Customer Service | Communication Strategies 1 | Managing for Quality | Promotion: Advertising | Promotion: Visual Merchandising | Retail Operations | Office Systems 1 | Communication Strategies 2 | Records Management 1 | The Business Organization | Business in the Canadian Economy | Business in the Global Marketplace | Promotion: Sales Techniques | Distributing Goods & Services | Setting Up a Retail Store | Office Systems 2 | Communication Strategies 3 | Records Management 2 |
| | 1010 | 1020 | 1030 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2080 | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 |
| Hand code scanner | | O | | | | | O | | | | | | | | | | | | |
| Interior display island | | | | | | | | | | | | | | | | | | | |
| end | | O | | | | O | | | | | | | | O | | | | | |
| platform | | O | | | | O | | | | | | | | O | | | | | |
| shadow box | | O | | | | O | | | | | | | | O | | | | | |
| Laminator | | O | | | O | O | | | | | | | | O | | | | | |
| LAN | | O | | | | | O | | | | | | | | | | | | |
| Mannequin | | O | | | O | | | | | | | | | | | | | | |
| Mirrors | | O | | | | | | | | | | | | O | | | | | |
| Modem/Internet connection | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Office desk/chair/lounge | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O |
| Portable billboard | | O | | | O | O | | | | | | | | O | | | | | |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## *MANAGEMENT AND MARKETING*

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Business Management Systems and Strategies
B. Marketing Systems and Strategies
C. Information Management Systems and Strategies

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | B | B | C | A | B | B | B | C | C | C | A | A | A | B | B | B | C | C | C |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | | | | | |
| INSTRUCTIONAL FACILITIES | | | * | | | | | * | * | | | | | | | | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | | | | | | | | | | | | |
| **EQUIPMENT** | Management & Marketing Basics | Quality Customer Service | Communication Strategies 1 | Managing for Quality | Promotion: Advertising | Promotion: Visual Merchandising | Retail Operations | Office Systems 1 | Communication Strategies 2 | Records Management 1 | The Business Organization | Business in the Canadian Economy | Business in the Global Marketplace | Promotion: Sales Techniques | Distributing Goods & Services | Setting Up a Retail Store | Office Systems 2 | Communication Strategies 3 | Records Management 2 |
| | 1010 | 1020 | 1030 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2080 | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 |
| Scanner | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Sign printer | | O | | | O | O | | | | | | | | O | | | | | |
| Stockroom | | O | | | | O | O | | | | | | | | | | | | |
| cooler/fridge/freezer | | O | | | | | | | | | | | | | | | | | |
| signs | | O | | | | | | | | | | | | | | | | | |
| Telephone | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | O | ✓ | O | O |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters for Mechanics

### Facilities

Several courses in the Mechanics scope and sequence can be delivered in a typical classroom setting. Refer to Attachment 4: CTS without Labs in this appendix. The majority require access to more specialized in-school and off-campus facilities, such as:

- space for vehicle work stations, overhead doors and hoists
- space for instruction and resources
- space for equipment and tool storage
- provision for exhaust/fume/dust extraction—depending on courses chosen
- provision for water, drainage and electrical services.

Also desirable, though not essential, are instructional facilities that have:

- whiteboards, bulletin boards and display cabinets
- access to a parking compound
- communication service—telephone, computer/modem and networking.

Courses that require access to facilities in addition to those present in a typical classroom setting are identified in the Course Parameters. For more information, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

Most courses in Mechanics—those identified with an asterisk—require special facilities to accommodate instruction and maintenance of vehicles. Needed facilities vary according to the type of vehicles used for instruction and the courses undertaken.

### Equipment

A recommended equipment list is provided in the Course Parameters chart. Though not exhaustive, the list identifies equipment recommended as necessary to meet the course outcomes when using the automobile as the vehicle. Make and models of equipment need to be determined locally.

Equipment for courses in Mechanics can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers may find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each course.

### Safety and Security Considerations

Maintaining a safe and secure environment is essential when delivering a Mechanics program. The following issues need to be addressed:

- procedures for laboratory/shop management
- provision for electrical power lockout in the absence of teacher/facilitator
- procedures for proper use of tools and equipment
- procedures to follow when an accident occurs
- preventative accident/equipment maintenance program
- safe laboratory/shop equipment layout.

**Instructional Qualifications**

Facilitation of the Mechanics program requires teachers having expertise in classrooms as well as lab/shop settings. Trade training and experience are essential for many courses. For students seeking apprenticeship articulation, instruction must be provided by teachers with trade qualifications, such as a journeyman certificate. To ensure compliance with industry safety standards, selected courses in brakes, steering and suspension require supervision by a journeyman when work is performed on road licensed vehicles.

Courses requiring additional instructor credentials are identified in the Course Parameters chart. For more information regarding each teacher/instructor credential, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

**Credentialling Opportunities**

Students may earn credentials recognized by business, industry and post-secondary institutions by demonstrating a specific set of competencies. Based on an articulation agreement established with the Apprenticeship and Industry Training Division, Alberta Advanced Education and Career Development, students who complete specified CTS courses may be eligible to obtain advanced standing in the apprenticeship program for Automotive Service Technician. Further details regarding each articulation agreement, including a correlation to CTS strands and courses, are provided in Appendix 5: Planning Ahead—CTS Transitions into Post-secondary Programs and the Workplace. Additional information can be obtained by contacting the Apprenticeship and Industry Training Division, Alberta Advanced Education and Career Development. A list of local Career Development Centres throughout Alberta is also provided in Appendix 5: Planning Ahead—CTS Transitions into Post-secondary Programs and the Workplace.

For more information regarding the credential, requirement/qualification and credentialling agency, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

## Course Parameters

## MECHANICS

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design and Ownership
B. Propulsion Systems
C. Guidance and Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | A | B | C | C | C | D | D | D | D | A | A | B | B | B | B | B | C | C | C | C | C | C | D | D | D |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | • | | | | | | | • | • | | | | • | • | |
| INSTRUCTIONAL FACILITY | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| CREDENTIALLING OPPORTUNITIES | | • | • | • | • | • | • | • | | | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| **EQUIPMENT** | Modes & Mechanisms | Vehicle Service & Care | Engine Fundamentals | Electrical Fundamentals | Pneumatics & Hydraulics | Mechanical Systems | Ride & Control Systems | Structures & Materials | Metal Forming & Finishing | Surface Preparation 1 | Vehicle Detailing | Vehicle Maintenance | Lubrication & Cooling | Fuel & Exhaust Systems | Alternative Fuel Engines | Ignition Systems | Emission Controls | Electrical Components | Power Assist Accessories | Braking Systems | Hydraulic Accessories | Drive Trains | Transmissions/Transaxles | Suspension Systems | Steering Systems | Metal Repair & Finishing |
| | 1010 | 1020 | 1040 | 1090 | 1110 | 1130 | 1150 | 1160 | 1170 | 1190 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 |
| Basic set of hand tools | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Air compressor | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| impact tool | | | | | | | | | | | | ○ | | | | | | | | | ○ | ✓ | ○ | ○ | ○ | ○ |
| Battery charger | ○ | ✓ | | ○ | | | | | | | | ✓ | | | | | | | | | | | | | | |
| Brake, sheet metal | ○ | | | | | | | ○ | | | | | | | | | | | | | | | | | | ✓ |
| lathe | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | |
| vacuum (asbestos) | | ○ | | | | | ○ | | | | | ○ | | | | | | | | ✓ | | | | | | |
| Cleaner, hot tank | | | ○ | | | | | | | | | | | | | | | | | | | | | | | |
| Computer/printer/modem | ✓ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | ○ | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| Drill press (bench) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| set (met/imp) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## MECHANICS

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design and Ownership
B. Propulsion Systems
C. Guidance and Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | D | D | D | D | D | A | A | B | B | B | B | B | B | C | C | C | C | C | C | D | D | D | D | D | D | D | D | D |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | • | • | | • | | | | | • | • | | | | |
| INSTRUCTIONAL FACILITIES | • | • | • | • | • | | • | • | • | • | • | • | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | • | • | • | • | • | | | | | | | • | • | | | | | | | | |
| **EQUIPMENT** | Trim Replacement | Surface Preparation 2 | Refinishing 1 | Touch-up & Finishing | Interior Repairs | Buying & Selling Vehicles | Vehicle Value Appraisal | Engine Diagnosis | Engine Tune-up | Engine Replacement | Engine Reconditioning 1 | Engine Reconditioning 2 | Alternative Energy Systems | Computer Systems | Safety Systems | Climate Control | Power Assisting | Automatic Transmissions | Drive Train Repair | Wheel Alignment | Body Repair Estimation | Damage Analysis | Damage Repair 1 | Damage Repair 2 | Refinishing 2 | Plastic & Fibreglass | Glass Replacement | Refinishing 3 |
| | 2180 | 2190 | 2200 | 2210 | 2220 | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 | 3180 | 3190 | 3200 | 3210 | 3220 | 3230 |
| Basic set of hand tools | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Air compressor | | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | | | ✓ |
| impact tool | | | | | | | | | | ○ | ○ | ○ | | | | | | ○ | ○ | ○ | | | | | | | | |
| Battery charger | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brake, sheet metal | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | | | | |
| lathe | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| vacuum (asbestos) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cleaner, hot tank | | | | | | | | | | | ✓ | ✓ | | | | | | | | | | | | | | | | |
| Computer/printer/modem | | | ○ | | | ○ | ○ | ✓ | ✓ | | | | ○ | ✓ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Drill press (bench) | | | | | ○ | | | | | | ✓ | ✓ | | | | | ○ | | ○ | | | | | | | | | |
| set (met/imp) | | ○ | | | ○ | | | | | | ✓ | ✓ | | | | | ○ | | ○ | | | | | | | | | |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## *MECHANICS*

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design and Ownership
B. Propulsion Systems
C. Guidance and Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | A | B | C | C | C | D | D | D | D | A | A | B | B | B | B | B | C | C | C | C | C | C | D | D | D |
| INSTRUCTIONAL QUALIFICATIONS |  |  |  |  |  |  |  |  |  |  |  | * |  |  |  |  |  |  | * | * |  |  |  | * | * |  |
| INSTRUCTIONAL FACILITY | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES |  | * | * | * | * | * | * | * |  |  |  | * | * | * | * | * | * | * | * | * | * | * | * | * | * |  |
| **EQUIPMENT** | Modes & Mechanisms | Vehicle Service & Care | Engine Fundamentals | Electrical Fundamentals | Pneumatics & Hydraulics | Mechanical Systems | Ride & Control Systems | Structures & Materials | Metal Forming & Finishing | Surface Preparation 1 | Vehicle Detailing | Vehicle Maintenance | Lubrication & Cooling | Fuel & Exhaust Systems | Alternative Fuel Engines | Ignition Systems | Emission Controls | Electrical Components | Power Assist Accessories | Braking Systems | Hydraulic Accessories | Drive Trains | Transmissions/Transaxles | Suspension Systems | Steering Systems | Metal Repair & Finishing |
|  | 1010 | 1020 | 1040 | 1090 | 1110 | 1130 | 1150 | 1160 | 1170 | 1190 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 |
| Drill, portable, heavy duty, variable speed, reversible | ✓ | ✓ | O | O | ✓ | ✓ | O | ✓ | ✓ | ✓ | O | ✓ | O | O | O | O | O | O | O | O | O | O | O | O | O | ✓ |
| Dust collection system |  |  |  |  |  |  |  |  | ✓ | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ |
| Engine analyzer |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Flusher, cooling system |  | O |  |  |  |  |  |  |  |  |  | O | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Frame straightener |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Grinder, portable angle |  |  |  |  | O |  | O |  | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ |
| tool (bench) | ✓ | ✓ | O | O | O | O | O | O | O |  |  | ✓ | O | O | O | O | O | O | O | O | O | O | O | O | O |  |
| valve reface |  |  | O |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| valve seat |  |  | O |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Headlight, aimer |  | O |  |  |  |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## *MECHANICS*

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design and Ownership
B. Propulsion Systems
C. Guidance and Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| LEVEL | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | D | D | D | D | D | A | A | B | B | B | B | B | B | C | C | C | C | C | C | D | D | D | D | D | D | D | D | D |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | * | * | | * | | | | | * | * | | | | |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | | * | * | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | * | * | * | * | * | | | | | | | * | * | | | | | | | | |
| EQUIPMENT | Trim Replacement | Surface Preparation 2 | Refinishing 1 | Touch-up & Finishing | Interior Repairs | Buying & Selling Vehicles | Vehicle Value Appraisal | Engine Diagnosis | Engine Tune-up | Engine Replacement | Engine Reconditioning 1 | Engine Reconditioning 2 | Alternative Energy Systems | Computer Systems | Safety Systems | Climate Control | Power Assisting | Automatic Transmissions | Drive Train Repair | Wheel Alignment | Body Repair Estimation | Damage Analysis | Damage Repair 1 | Damage Repair 2 | Refinishing 2 | Plastic & Fibreglass | Glass Replacement | Refinishing 3 |
| | 2180 | 2190 | 2200 | 2210 | 2220 | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 | 3180 | 3190 | 3200 | 3210 | 3220 | 3230 |
| Drill, portable, heavy duty, variable speed, reversible | O | O | | ✓ | ✓ | | | O | | O | ✓ | ✓ | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | | |
| Dust collection system | | ✓ | | O | | | | | | | | | | | | | | | | | | | ✓ | ✓ | | ✓ | | ✓ |
| Engine analyzer | | | | | | O | | ✓ | ✓ | | | | | | | | | | | | | | | | | | | |
| Flusher, cooling system | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Frame straightener | | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | |
| Grinder, portable angle | | O | O | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | | ✓ | | O |
| tool (bench) | | O | O | O | O | | | O | | | ✓ | ✓ | | | | | | | | | | | O | O | O | | | |
| valve reface | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | | | |
| valve seat | | | | | | | | | | | ✓ | | | | | | | | | | | | | | | | | |
| Headlight, aimer | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## MECHANICS

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design and Ownership
B. Propulsion Systems
C. Guidance and Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| EQUIPMENT | Modes & Mechanisms 1010 | Vehicle Service & Care 1020 | Engine Fundamentals 1040 | Electrical Fundamentals 1090 | Pneumatics & Hydraulics 1110 | Mechanical Systems 1130 | Ride & Control Systems 1150 | Structures & Materials 1160 | Metal Forming & Finishing 1170 | Surface Preparation 1 1190 | Vehicle Detailing 2010 | Vehicle Maintenance 2020 | Lubrication & Cooling 2030 | Fuel & Exhaust Systems 2040 | Alternative Fuel Engines 2050 | Ignition Systems 2060 | Emission Controls 2070 | Electrical Components 2090 | Power Assist Accessories 2100 | Braking Systems 2110 | Hydraulic Accessories 2120 | Drive Trains 2130 | Transmissions/Transaxles 2140 | Suspension Systems 2150 | Steering Systems 2160 | Metal Repair & Finishing 2170 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | A | B | C | C | C | D | D | D | D | A | A | B | B | B | B | B | C | C | C | C | C | C | D | D | D |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | * | | | | | | | * | * | | | | * | * | |
| INSTRUCTIONAL FACILITY | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | * | * | * | * | * | * | * | | | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | |
| Hoist, auto, electric | | O | O | O | O | O | O | | | | | O | O | O | | O | O | | O | O | O | O | O | O | O | |
| engine | | | O | | | | | | | | | | | | | | | | | | | | | | | |
| Honing machine | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hydrolauncher | O | | | | O | | | | | | | | | | | | | | | | | | | | | |
| Individual testers, e.g., battery, charging, infrared, volt/ohm etc. | | O | | ✓ | | | | | | | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| Jack, stands | | ✓ | O | O | ✓ | ✓ | ✓ | ✓ | O | | | ✓ | | O | | | O | | O | O | O | O | O | O | O | |
| automotive (floor) | | ✓ | O | O | ✓ | ✓ | ✓ | ✓ | O | | | ✓ | O | O | | | O | | O | O | O | O | O | O | O | |
| body and frame | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mask, fresh air | | | | | | | | | O | | | | | | | | | | | | | | | | | ✓ |
| Mixer, paint | | | | | | | | | O | | | | | | | | | | | | | | | | | O |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## *MECHANICS*

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design and Ownership
B. Propulsion Systems
C. Guidance and Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| LEVEL | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | D | D | D | D | D | A | A | B | B | B | B | B | B | C | C | C | C | C | C | D | D | D | D | D | D | D | D | D |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | * | * | | * | | | | | * | * | | | | |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | | * | * | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | * | * | * | * | * | | | | | | | * | * | | | | | | | | |
| **EQUIPMENT** | Trim Replacement | Surface Preparation 2 | Refinishing 1 | Touch-up & Finishing | Interior Repairs | Buying & Selling Vehicles | Vehicle Value Appraisal | Engine Diagnosis | Engine Tune-up | Engine Replacement | Engine Reconditioning 1 | Engine Reconditioning 2 | Alternative Energy Systems | Computer Systems | Safety Systems | Climate Control | Power Assisting | Automatic Transmissions | Drive Train Repair | Wheel Alignment | Body Repair Estimation | Damage Analysis | Damage Repair 1 | Damage Repair 2 | Refinishing 2 | Plastic & Fibreglass | Glass Replacement | Refinishing 3 |
| | 2180 | 2190 | 2200 | 2210 | 2220 | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 | 3180 | 3190 | 3200 | 3210 | 3220 | 3230 |
| Hoist, auto, electric | | | | | | O | O | O | O | O | O | O | | | O | | O | O | O | ✓ | O | O | | | | | | |
| engine | | | | | | | | | | ✓ | O | ✓ | | | | | | | | | | | | | | | | |
| Honing machine | | | | | | | | | | | O | ✓ | | | | | | | | | | | | | | | | |
| Hydrolauncher | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Individual testers, e.g., battery, charging, infrared, volt/ohm etc. | | | | | | | | ✓ | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| Jack, stands | | | | | | O | O | O | O | ✓ | O | O | | | O | O | O | O | O | O | O | O | O | O | | | | |
| automotive (floor) | | | | | | O | O | O | O | ✓ | O | O | | | O | O | O | O | O | O | O | O | O | O | | | | |
| body and frame | | | | | | O | O | O | O | | | | | | | | | | | | O | O | O | O | | | | |
| Mask, fresh air | | O | O | O | | | | | | | | | | | | | | | | | | | | | ✓ | O | | ✓ |
| Mixer, paint | | | O | O | | | | | | | | | | | | | | | | | | | | | ✓ | O | | ✓ |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## *MECHANICS*

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THEME
A. Vehicle Design and Ownership
B. Propulsion Systems
C. Guidance and Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | A | B | C | C | C | D | D | D | D | A | A | B | B | B | B | B | C | C | C | C | C | C | D | D | D |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | * | | | | | | | * | * | | | | * | * | |
| INSTRUCTIONAL FACILITY | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | * | * | * | * | * | * | * | | | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | |
| **EQUIPMENT** | Modes & Mechanisms | Vehicle Service & Care | Engine Fundamentals | Electrical Fundamentals | Pneumatics & Hydraulics | Mechanical Systems | Ride & Control Systems | Structures & Materials | Metal Forming & Finishing | Surface Preparation 1 | Vehicle Detailing | Vehicle Maintenance | Lubrication & Cooling | Fuel & Exhaust Systems | Alternative Fuel Engines | Ignition Systems | Emission Controls | Electrical Components | Power Assist Accessories | Braking Systems | Hydraulic Accessories | Drive Trains | Transmissions/Transaxles | Suspension Systems | Steering Systems | Metal Repair & Finishing |
| | 1010 | 1020 | 1040 | 1090 | 1110 | 1130 | 1150 | 1160 | 1170 | 1190 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 |
| Mobile lift (air operated) | | ○ | | | | | | | | | | ○ | | | | | | | | | | | | ○ | ○ | |
| Nibbler | | | | | | | | ○ | ✓ | | | | | | | | | | | | | | | | | ✓ |
| Oil drain (mobile) | | ○ | ○ | | ✓ | | | | | | | | | | | | | | | | | | | | | |
| Paper machine | | | | | | | | | ○ | ○ | | | | | | | | | | | | | | | | |
| Polisher, portable | | ○ | | | | | | | | | ✓ | ○ | | | | | | | | | | | | | | |
| Press, arbor | | | | ○ | ○ | ○ | ○ | | | | | | | | | | | ○ | | | | ✓ | ○ | ○ | ○ | |
| hydraulic | | | | | | | | | | | | | | | | | | | | | | ○ | | ✓ | | |
| Pump, car wash (high pressure washer) | | ○ | | | ○ | ○ | | | | | ✓ | ✓ | ○ | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| Raceway, manual start | ○ | | | | | | | | | | | | | | | | | | | | | | | | | |
| Roller, forming | ○ | | | | | | | ○ | ○ | | | | | | | | | | | | | | | | | ✓ |
| Sander, disc (portable) | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

**MECHANICS**

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design and Ownership
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C. Guidance and Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | D | D | D | D | D | A | A | B | B | B | B | B | B | C | C | C | C | C | C | D | D | D | D | D | D | D | D | D |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | * | * | | * | | | | | * | * | | | | |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | | * | * | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | * | * | * | * | * | | | | | | | * | * | | | | | | | | |
| EQUIPMENT | Trim Replacement | Surface Preparation 2 | Refinishing 1 | Touch-up & Finishing | Interior Repairs | Buying & Selling Vehicles | Vehicle Value Appraisal | Engine Diagnosis | Engine Tune-up | Engine Replacement | Engine Reconditioning 1 | Engine Reconditioning 2 | Alternative Energy Systems | Computer Systems | Safety Systems | Climate Control | Power Assisting | Automatic Transmissions | Drive Train Repair | Wheel Alignment | Body Repair Estimation | Damage Analysis | Damage Repair 1 | Damage Repair 2 | Refinishing 2 | Plastic & Fibreglass | Glass Replacement | Refinishing 3 |
| | 2180 | 2190 | 2200 | 2210 | 2220 | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 | 3180 | 3190 | 3200 | 3210 | 3220 | 3230 |
| Mobile lift (air operated) | | | | | | | ○ | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | | | | |
| Nibbler | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | | | | |
| Oil drain (mobile) | | | | | | | | | | ○ | ○ | ○ | | | | | | | | | | | | | | | | |
| Paper machine | | | ✓ | ○ | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | | ✓ |
| Polisher, portable | | | ○ | ✓ | | | | | | | | | | | | | | | | | | | | | ✓ | | | ✓ |
| Press, arbor | | | | | | | | | | | ○ | ○ | | | | | | ○ | | | | | | | | | | |
| hydraulic | | | | | | | | | | | | | | | | | | | ✓ | ○ | | | | | | | | |
| Pump, car wash (high pressure washer) | | | | | | | | | | | ○ | ○ | | | | | | ✓ | ✓ | | | | | | | | | |
| Raceway, manual start | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Roller, forming | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | | | | |
| Sander, disc (portable) | | ✓ | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | | ✓ |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## *MECHANICS*

LEVEL
1 – Introductory
2 – Intermediate
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THEME
A. Vehicle Design and Ownership
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C. Guidance and Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | A | B | C | C | C | D | D | D | D | A | A | B | B | B | B | B | C | C | C | C | C | C | D | D | D |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | * | | | | | | | * | * | | | | * | * | |
| INSTRUCTIONAL FACILITY | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | * | * | * | * | * | * | * | | | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | |
| **EQUIPMENT** | Modes & Mechanisms | Vehicle Service & Care | Engine Fundamentals | Electrical Fundamentals | Pneumatics & Hydraulics | Mechanical Systems | Ride & Control Systems | Structures & Materials | Metal Forming & Finishing | Surface Preparation 1 | Vehicle Detailing | Vehicle Maintenance | Lubrication & Cooling | Fuel & Exhaust Systems | Alternative Fuel Engines | Ignition Systems | Emission Controls | Electrical Components | Power Assist Accessories | Braking Systems | Hydraulic Accessories | Drive Trains | Transmissions/Transaxles | Suspension Systems | Steering Systems | Metal Repair & Finishing |
| | 1010 | 1020 | 1040 | 1090 | 1110 | 1130 | 1150 | 1160 | 1170 | 1190 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 |
| Sander, oscillating (portable) | | | | | | | | | O | O | | | | | | | | | | | | | | | | ✓ |
| Shaker, paint | | | | | | | | | O | | | | | | | | | | | | | | | | | O |
| Shear, squaring | O | | | | | | | | O | | | | | | | | | | | | | | | | | ✓ |
| Spray booth | | | | | | | | | O | | | | | | | | | | | | | | | | | O |
| gun | | | | | | | | | ✓ | | O | | | | | | | | | | | | | | | ✓ |
| Storage tank, waste oil | | ✓ | ✓ | | O | | | | | | | ✓ | ✓ | | | | | | | | | | | | | |
| Tap and die set (NC/NF, met/imp) | O | ✓ | O | O | O | O | | O | O | | | O | | | | O | O | ✓ | | | | | | | | ✓ |
| Tester, alternator | | | | O | | | | | | | | | | | | | | ✓ | | | | | | | | |
| armature | | | | O | | | | | | | | | | | | | | ✓ | | | | | | | | |
| circuit | | O | | ✓ | | | | | | | | O | | | | | | ✓ | | | | | | | | |
| engine performance | | | | | | | | | | | | O | | ✓ | | ✓ | ✓ | | | | | | | | | |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

## MECHANICS

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design and Ownership
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C. Guidance and Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | D | D | D | D | D | A | A | B | B | B | B | B | B | C | C | C | C | C | C | D | D | D | D | D | D | D | D | D |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | * | * | | * | | | | | * | * | | | | |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | | * | * | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | * | * | * | * | * | | | | | | | * | * | | | | | | | | |
| EQUIPMENT | Trim Replacement | Surface Preparation 2 | Refinishing 1 | Touch-up & Finishing | Interior Repairs | Buying & Selling Vehicles | Vehicle Value Appraisal | Engine Diagnosis | Engine Tune-up | Engine Replacement | Engine Reconditioning 1 | Engine Reconditioning 2 | Alternative Energy Systems | Computer Systems | Safety Systems | Climate Control | Power Assisting | Automatic Transmissions | Drive Train Repair | Wheel Alignment | Body Repair Estimation | Damage Analysis | Damage Repair 1 | Damage Repair 2 | Refinishing 2 | Plastic & Fibreglass | Glass Replacement | Refinishing 3 |
| | 2180 | 2190 | 2200 | 2210 | 2220 | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 | 3180 | 3190 | 3200 | 3210 | 3220 | 3230 |
| Sander, oscillating (portable) | | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | | ✓ |
| Shaker, paint | | | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | ✓ | | | ✓ |
| Shear, squaring | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | | | | |
| Spray booth | | | ✓ | ○ | | | | | | | | | | | | | | | | | | | | | ✓ | | | ✓ |
| gun | | | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | ✓ | | | ✓ |
| Storage tank, waste oil | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tap and die set (NC/NF, met/imp) | | | | | ○ | | | | | ○ | ○ | ○ | | | | | | | ○ | | | | ○ | ○ | ✓ | | ✓ | |
| Tester, alternator | | | | | | | | ✓ | ✓ | | | | | | | | | | | | | | | | | | | |
| armature | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| circuit | | | | | | | ○ | ✓ | ✓ | | | | | | ✓ | ✓ | ✓ | | | | | | | | | | | |
| engine performance | | | | | | | ○ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | |

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## Course Parameters

## MECHANICS

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THEME
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D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| EQUIPMENT | Modes & Mechanisms 1010 | Vehicle Service & Care 1020 | Engine Fundamentals 1040 | Electrical Fundamentals 1090 | Pneumatics & Hydraulics 1110 | Mechanical Systems 1130 | Ride & Control Systems 1150 | Structures & Materials 1160 | Metal Forming & Finishing 1170 | Surface Preparation 1 1190 | Vehicle Detailing 2010 | Vehicle Maintenance 2020 | Lubrication & Cooling 2030 | Fuel & Exhaust Systems 2040 | Alternative Fuel Engines 2050 | Ignition Systems 2060 | Emission Controls 2070 | Electrical Components 2090 | Power Assist Accessories 2100 | Braking Systems 2110 | Hydraulic Accessories 2120 | Drive Trains 2130 | Transmissions/Transaxles 2140 | Suspension Systems 2150 | Steering Systems 2160 | Metal Repair & Finishing 2170 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| THEME | A | A | B | C | C | C | D | D | D | D | A | A | B | B | B | B | B | C | C | C | C | C | C | D | D | D |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | • | | | | | | | • | • | | | | • | • | |
| INSTRUCTIONAL FACILITY | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| CREDENTIALLING OPPORTUNITIES | | • | • | • | • | • | • | • | | | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| Tester, power steering | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | |
| Tire changer | | ○ | | | | | | | | | | ✓ | | | | | | | | | | | | ○ | ○ | |
| balancer | | ○ | | | | | | | | | | ✓ | | | | | | | | | | | | ✓ | ✓ | |
| Trainer, electrical | | | | ○ | | | | | | | | | | | | | | ○ | | | | | | | | |
| fluid power | | | | | ○ | | | | | | | | | | | | | | | | | | | | | |
| mechanical | | | | | | ○ | | | | | | | | | | | | | | | | | | | | |
| Vacuum cleaner | ○ | ✓ | | | | ○ | ○ | ✓ | | | ✓ | ✓ | | | | | | | | | | | | | | |
| Vise, machinist | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Washer, parts | | ○ | ○ | | ○ | ○ | ○ | | | | | ○ | | | | | | ○ | | | ○ | ○ | ○ | ○ | ○ | |
| Welder, GMAW | ○ | | | | | | | ✓ | ✓ | | | | | | | | | | | | | | | | | ✓ |
| GMAW, semi-automatic | | | | | | | | | ○ | | | | | | | | | | | | | | | | | ○ |
| oxyacetylene c/w accessories | ○ | ○ | | | | | | ✓ | ✓ | | | | | ✓ | | | | | | ○ | | | | | | ○ |

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## Course Parameters

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EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

|  | Trim Replacement | Surface Preparation 2 | Refinishing 1 | Touch-up & Finishing | Interior Repairs | Buying & Selling Vehicles | Vehicle Value Appraisal | Engine Diagnosis | Engine Tune-up | Engine Replacement | Engine Reconditioning 1 | Engine Reconditioning 2 | Alternative Energy Systems | Computer Systems | Safety Systems | Climate Control | Power Assisting | Automatic Transmissions | Drive Train Repair | Wheel Alignment | Body Repair Estimation | Damage Analysis | Damage Repair 1 | Damage Repair 2 | Refinishing 2 | Plastic & Fibreglass | Glass Replacement | Refinishing 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | D | D | D | D | D | A | A | B | B | B | B | B | B | C | C | C | C | C | C | D | D | D | D | D | D | D | D | D |
| INSTRUCTIONAL QUALIFICATIONS |  |  |  |  |  |  |  |  |  |  |  |  |  |  | • | • |  | • |  |  |  |  | • | • |  |  |  |  |
| INSTRUCTIONAL FACILITIES | • | • | • | • | • |  | • | • | • | • | • | • |  | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| CREDENTIALLING OPPORTUNITIES |  |  |  |  |  |  |  | • | • | • | • | • |  |  |  |  |  |  | • | • |  |  |  |  |  |  |  |  |
| EQUIPMENT | 2180 | 2190 | 2200 | 2210 | 2220 | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 | 3180 | 3190 | 3200 | 3210 | 3220 | 3230 |
| Tester, power steering |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |  |  |  |
| Tire changer |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ○ |  |  |  |  |  |  |  |  |
| balancer |  |  |  |  |  |  | ○ |  |  |  |  |  |  |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |
| Trainer, electrical |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| fluid power |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| mechanical |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Vacuum cleaner |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ |  |  |
| Vise, machinist |  | ○ |  |  | ○ |  |  |  | ○ |  | ✓ | ✓ |  | ○ | ○ | ○ | ○ | ○ | ○ | ○ |  |  | ○ | ○ |  | ○ | ○ |  |
| Washer, parts |  |  |  |  |  |  |  |  |  |  | ✓ | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Welder, GMAW |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| GMAW, semi-automatic |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ | ✓ |  |  |  |  |
| oxyacetylene c/w accessories |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ | ✓ |  |  |  |  |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design and Ownership
B. Propulsion Systems
C. Guidance and Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | A | B | C | C | C | D | D | D | D | A | A | B | B | B | B | B | C | C | C | C | C | C | D | D | D |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | • | | | | | | | • | • | | | | • | • | |
| INSTRUCTIONAL FACILITY | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| CREDENTIALLING OPPORTUNITIES | | • | • | • | • | • | • | • | | | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| EQUIPMENT | Modes & Mechanisms | Vehicle Service & Care | Engine Fundamentals | Electrical Fundamentals | Pneumatics & Hydraulics | Mechanical Systems | Ride & Control Systems | Structures & Materials | Metal Forming & Finishing | Surface Preparation 1 | Vehicle Detailing | Vehicle Maintenance | Lubrication & Cooling | Fuel & Exhaust Systems | Alternative Fuel Engines | Ignition Systems | Emission Controls | Electrical Components | Power Assist Accessories | Braking Systems | Hydraulic Accessories | Drive Trains | Transmissions/Transaxles | Suspension Systems | Steering Systems | Metal Repair & Finishing |
| | 1010 | 1020 | 1040 | 1090 | 1110 | 1130 | 1150 | 1160 | 1170 | 1190 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2090 | 2100 | 2110 | 2120 | 2130 | 2140 | 2150 | 2160 | 2170 |
| Welder, spot | ○ | | | | | | | | ○ | | | | | | | | | | | | | | | | | ✓ |
| Wheel alignment (portable) | | | | | | | | | | | | ✓ | | | | | | | | | | | | ○ | ○ | |
| balancer | | ○ | | | | | | | | | | ✓ | | | | | | | | | | | | ✓ | ✓ | |
| Zip gun | | | | | | | | | ✓ | | | | | | | | | | | | | | | | | ○ |

• Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

***MECHANICS***

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design and Ownership
B. Propulsion Systems
C. Guidance and Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| THEME | D | D | D | D | D | A | A | B | B | B | B | B | B | C | C | C | C | C | C | D | D | D | D | D | D | D | D | D |
| INSTRUCTIONAL QUALIFICATIONS | | | | | | | | | | | | | | | * | * | | * | | | | | * | * | | | | |
| INSTRUCTIONAL FACILITIES | * | * | * | * | * | | * | * | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CREDENTIALLING OPPORTUNITIES | | | | | | | | * | * | * | * | * | | | | | | | * | * | | | | | | | | |
| **EQUIPMENT** | Trim Replacement | Surface Preparation 2 | Refinishing 1 | Touch-up & Finishing | Interior Repairs | Buying & Selling Vehicles | Vehicle Value Appraisal | Engine Diagnosis | Engine Tune-up | Engine Replacement | Engine Reconditioning 1 | Engine Reconditioning 2 | Alternative Energy Systems | Computer Systems | Safety Systems | Climate Control | Power Assisting | Automatic Transmissions | Drive Train Repair | Wheel Alignment | Body Repair Estimation | Damage Analysis | Damage Repair 1 | Damage Repair 2 | Refinishing 2 | Plastic & Fibreglass | Glass Replacement | Refinishing 3 |
| | 2180 | 2190 | 2200 | 2210 | 2220 | 3010 | 3020 | 3030 | 3040 | 3050 | 3060 | 3070 | 3080 | 3090 | 3100 | 3110 | 3120 | 3130 | 3140 | 3150 | 3160 | 3170 | 3180 | 3190 | 3200 | 3210 | 3220 | 3230 |
| Welder, spot | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | | | | |
| Wheel alignment (portable) | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | |
| balancer | | | | | | | ○ | | | | | | | | | | | | | ✓ | | | | | | | | |
| Zip gun | | | | ✓ | | | | | | | | | | | | | | | | | | | | | ✓ | | | ✓ |

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters for Wildlife

### Facilities

Some courses in the Wildlife scope and sequence can be delivered in a typical classroom setting. Refer to Attachment 4: CTS without Labs in this appendix. Others require access to more specialized in-school and off-campus facilities, such as:

- outdoor environments; e.g., endangered spaces, forested areas, natural areas, protected areas, wetland areas
- a science laboratory
- controlled environments for providing plant and/or animal care
- observation and training sites sponsored by relevant government, industry and/or post-secondary agencies
- resource centres equipped with computer hardware/software and audio-visual material.

Also desirable, though not essential, are instructional facilities that have:

- water and sinks
- display and storage areas for specimens and artifacts
- whiteboards/bulletin boards
- fresh air and fume extraction
- an exterior exit
- telephone service
- coolers and/or refrigeration.

Courses that require access to facilities in addition to those present in a typical classroom setting are identified in the Course Parameters. For more information, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

### Equipment

An equipment list is provided in the Course Parameters chart. Though not exhaustive, the list identifies recommended and optional equipment for meeting the course outcomes.

Equipment for courses in Wildlife can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers may find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each course.

### Safety Considerations

Facilities used to support a Wildlife program must ensure a safe learning/working environment. Students must be aware of federal, provincial and local regulations governing the tasks they perform, and adhere to appropriate personal and environmental health and safety procedures in courses that involve:

- the use of specialized hand/power equipment
- the handling and storage of hazardous materials
- outdoor trips and field-based investigations.

Students must understand immediate and potential hazards associated with the tasks they perform, and the possible impact of these hazards on self, others and the environment.

**Instructional Qualifications**

Courses in Wildlife can be implemented by Alberta Certified Teachers who have interest in providing instruction in classroom, laboratory and/or outdoor environments. A background in science and/or natural resource management is an asset to those who provide instruction in Wildlife courses, particularly at the intermediate and advanced levels. Teachers may find it desirable to access sources of instructional support available from relevant government agencies; e.g., Alberta Environmental Protection, Parks Canada, professional associations and consultants, and related industry; e.g., agriculture, forestry, tourism.

To ensure compliance with safety and industry standards, some courses require that components of instruction be provided by a person(s) having additional credentials granted by industry, government or community organizations. Wildlife courses requiring additional instructor credentials are identified in the Course Parameters chart. For more information, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

**Credentialling Opportunities**

Some courses within the Wildlife strand provide opportunities for students to earn either complete or partial credentials recognized by industry and/or post-secondary institutions. Courses that link with credentialling opportunities relevant to wildlife and the environmental sector are identified in the Course Parameters chart. For more information regarding the credential, requirement/qualification and credentialling agency, see the corresponding course in Sections D, E and F of the *Guide to Standards and Implementation*.

## Course Parameters

**WILDLIFE**

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Social and Cultural Perspectives
B. Technology and Applications
C. Management and Conservation

EQUIPMENT
✓ Recommended in order to meet course outcomes
○ Optional in providing access to supportive learning environments

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| THEME | A | A | A | C | C | C | A | A | B | C | C | C | A | B | C | C | C |
| INSTRUCTIONAL QUALIFICATIONS | | | * | | * | * | | * | | | * | | | | | | |
| INSTRUCTIONAL FACILITIES | | | * | | * | * | | * | | | * | | | * | | | |
| CREDENTIALLING OPPORTUNITIES | | | * | | * | * | | * | | | * | | | | | | |
| **EQUIPMENT** | What is Wildlife? | Natural History of Wildlife | Outdoor Experiences 1 | Taking Responsibility | Hunting & Game Management 1 | Angling & Fish Management | Measuring the Value | Outdoor Experiences 2 | Wildlife Spaces & Species | Interactions | Hunting & Game Management 2 | Issues in Wildlife 1 | Making a Difference | Wildlife Research | Wildlife Management 1 | Wildlife Management 2 | Issues in Wildlife 2 |
| | 1010 | 1020 | 1030 | 1050 | 1070 | 1080 | 2020 | 2030 | 2040 | 2060 | 2070 | 2090 | 3020 | 3040 | 3050 | 3060 | 3090 |
| Audio recorder | ○ | ○ | | | | | | | ○ | | | | | | | | |
| Binoculars | ○ | ○ | ○ | | | | | ○ | ○ | | | | | | | | |
| Camcorder | ○ | ○ | | | | | | | ○ | | | | | | | | |
| Camera | ○ | ○ | | | | | | | ○ | | | | | | | | |
| Camping gear (1) | | | ✓ | | | | | ✓ | | | | | | | | | |
| Compass | | | ✓ | | | | | ✓ | | | | | | | | | |
| Computers and software | | | | ✓ | | | ✓ | | | | | | | | | | |
| First aid supplies | | | ✓ | | | | | ✓ | | | | | | | | | |
| Map (2) | | | ✓ | | | | | ✓ | ○ | | | | | | | | |
| Microscope | ✓ | ✓ | | | | | | | ✓ | | | | | | | | |

(1) Camping gear includes tent, campstove, sleeping bag, cooking utensils, lantern, knife, saw, sanitary supplies, personal grooming items.
(2) Maps include topographic, climatic, ecosystem and soil type.

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

## Course Parameters

**WILDLIFE**

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Social and Cultural Perspectives
B. Technology and Applications
C. Management and Conservation

EQUIPMENT
✓ Recommended in order to meet course outcomes
O Optional in providing access to supportive learning environments

| LEVEL | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THEME | A | A | A | C | C | C | A | A | B | C | C | C | A | B | C | C | C |
| INSTRUCTIONAL QUALIFICATIONS |  |  | * |  | * | * |  | * |  |  | * |  |  |  |  |  |  |
| INSTRUCTIONAL FACILITIES |  |  | * |  | * | * |  | * |  |  | * |  |  | * |  |  |  |
| CREDENTIALLING OPPORTUNITIES |  |  | * |  | * | * |  | * |  |  | * |  |  |  |  |  |  |
| **EQUIPMENT** | What is Wildlife? | Natural History of Wildlife | Outdoor Experiences 1 | Taking Responsibility | Hunting & Game Management 1 | Angling & Fish Management | Measuring the Value | Outdoor Experiences 2 | Wildlife Spaces & Species | Interactions | Hunting & Game Management 2 | Issues in Wildlife 1 | Making a Difference | Wildlife Research | Wildlife Management 1 | Wildlife Management 2 | Issues in Wildlife 2 |
|  | 1010 | 1020 | 1030 | 1050 | 1070 | 1080 | 2020 | 2030 | 2040 | 2060 | 2070 | 2090 | 3020 | 3040 | 3050 | 3060 | 3090 |
| Outdoor gear (3) |  |  | ✓ |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |  |
| Personal safety equipment (4) |  |  | O |  |  |  |  | O |  |  |  |  |  |  |  |  |  |
| Photos, aerial |  |  | ✓ |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |  |
| Riker (permanent display) mounts | ✓ | ✓ |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |
| Sampling tools (5) | ✓ | O |  |  |  |  |  |  | ✓ | ✓ |  |  |  |  |  |  |  |
| Slides/specimens, plant and animal | ✓ | ✓ |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |

(3) Outdoor gear includes bush clothing, backpack, outdoor boots, rain gear, canoe, snowshoes, cross-country skis, as required.
(4) Personal safety equipment includes hard hat, safety glasses, ear protectors, pressure and triangular bandages, as required.
(5) Sampling tools include spade, traps and dip nets, as required.

* Refer to specific 1-credit courses listed in Sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

**Attachment 2**

## Developing a Facility Improvement Plan

Listed below are eight major steps with supporting actions that might be taken in developing a facility improvement plan for CTS. Although listed in sequential order, the steps and actions can be modified to accommodate local needs.

### Step 1: Identify Intended Outcome

- ☐ specify desired strands to be offered
- ☐ formalize the scope of project
- ☐ review external factors that need to be considered; e.g., political, economic

### Step 2: Organize an Advisory Team

- ☐ identify potential members of the team
- ☐ consider all stakeholders
- ☐ assess qualities of potential members
- ☐ determine staff involvement and level of authority
- ☐ establish communication plan

### Step 3: Determine Program Needs

- ☐ conduct needs assessment
- ☐ confirm strands and courses to be offered
- ☐ develop plans for changes to facilities and equipment
- ☐ gain preliminary informal support

### Step 4: Establish Project Timelines

- ☐ identify key dates/deadlines for the project
- ☐ establish timeline for planning and implementation efforts
- confirm proposed agenda with school personnel

### Step 5: Complete Planning Phase

- ☐ review existing equipment/materials
- ☐ finalize new equipment/material needs

### Step 5: Complete Planning Phase
(continued)

- ☐ propose budget details
- ☐ explore sources of funding
- ☐ complete renovation plans
- ☐ confirm plans with school and school system administration
- ☐ prepare formal presentations

### Step 6: Present Plans to Authorities

- ☐ develop support among key stakeholders; e.g., advisory committee, principal
- ☐ present plan to school and school system administration
- ☐ modify plans, schedules, budget as required
- ☐ gain formal approval
- ☐ submit application for funding

### Step 7: Implement the Plan

- ☐ improve program and facility as planned
- ☐ monitor/evaluate implementation efforts
- ☐ adjust plans and make changes as required

### Step 8: Follow-up and Review

- ☐ review improvements with school authorities
- ☐ compare results to original plans
- ☐ formalize safety plans and maintenance program
- ☐ implement strategic plans to continue development

## Sample Checklist for Facility Planning

The following checklist for facility planning can be modified as required to plan facilities that enhance teaching, learning and safety in CTS.

| **Determining Need** | **Yes** | **No** |
|---|---|---|
| • Has a need assessment been completed? | ______ | ______ |
| • Has achieving the learner outcomes been planned? | ______ | ______ |
| • Can these outcomes be met within the existing school and resources? | ______ | ______ |
| • Are there community resources that meet these needs? | ______ | ______ |
| • Will a facility modernization within the school meet the needs? | ______ | ______ |
| • Is new space required? | ______ | ______ |

| **Developing the Concept** | **Yes** | **No** |
|---|---|---|
| • Has there been input from the community, students, staff, business, industry, organizations, local government? | ______ | ______ |
| • Have other districts and schools been contacted? | ______ | ______ |
| • Has there been discussion with local teachers, administrators and board members? | ______ | ______ |
| • Has the project been discussed with outside consultants? | ______ | ______ |
| • Are labs/work stations similar to those found in the occupations represented? | ______ | ______ |
| • Is there a need for direct outside access for customer service and delivery of materials? | ______ | ______ |
| • Has consideration been given to the relationship of spaces in and outside the facility? | ______ | ______ |
| • Is there a logical arrangement for instruction and lab management with adequate areas for both group and individualized instruction? | ______ | ______ |
| • Is there space for an instructor work centre? | ______ | ______ |
| • Is an instructional resource centre available/appropriate? | ______ | ______ |
| • Are there sufficient number of work stations? | ______ | ______ |
| • Have opportunities for curriculum integration been discussed? | ______ | ______ |
| • Has consideration been given for accessibility for all students including those with physical disabilities? | ______ | ______ |
| • Is it a safe environment overall? | ______ | ______ |

| **Furnishings and Equipment** | **Yes** | **No** |
|---|---|---|
| • Will modular furniture and cabinets be used? | ______ | ______ |
| • Will modular units be mobile where possible? | ______ | ______ |
| • Are the work surfaces and flooring appropriate for projected activities? | ______ | ______ |
| • Are assembly, fabrication, preparation areas adequate/appropriate? | ______ | ______ |
| • Are there sufficient white boards, bulletin boards, display boards and projection screens? | ______ | ______ |
| • Is there space to display three-dimensional work? | ______ | ______ |

**Attachment 3** (continued)

| **Furnishings and Equipment** (continued) | **Yes** | **No** |
|---|---|---|
| • Is there sufficient storage space for equipment, instructional materials and supplies? | | |
| • Is there locker space for all students? | | |
| • Are there adequate utility connections for power, water, gas, etc? | | |
| • Have make, model, accessories, space needs and power requirements of the equipment been identified? | | |
| • Are there provisions for exhaust, ventilation, acoustics and illumination? | | |
| • Are provisions made for use of multimedia; i.e., sound, light control? | | |
| • Has a sketch been prepared to show the location of furnishings and equipment within the work centres (independent study or group work areas)? | | |
| • Are equipment and supplies adequate for the tasks identified for the program? | | |
| • Is there conformity to local, provincial and federal health and safety regulations? | | |
| • Is there sufficient space between work stations and equipment for a safe traffic flow pattern? | | |
| • Is it a safe environment overall? | | |

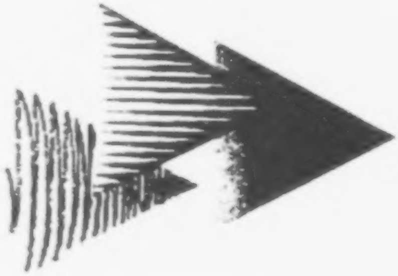
| **Ambient Features** | **Yes** | **No** |
|---|---|---|
| • Does the colour scheme enhance the mental and physical well-being of the students and staff? | | |
| • Is there sufficient natural and full spectrum lighting? | | |
| • Are walls, ceiling and floor durable, yet appealing? | | |
| • Are there areas for small group work? | | |
| • Are there quiet spaces for students to engage in reflective thinking? | | |
| • Is there a visible and "customer" friendly location for the community to contact the school? | | |

**Attachment 4**

## CTS without Labs

The following chart has been prepared to assist schools in determining which CTS courses can be offered in a regular classroom setting. In order to meet the curriculum and assessment standards for a course, it is assumed that students would have access to appropriate teaching and learning resources. Furthermore, it may be necessary to provide opportunities for students to gain practical experiences through participation in field trips and/or the use of computer simulations and other multimedia software.

| STRAND | Introductory Level | Intermediate Level | Advanced Level |
|---|---|---|---|
| Agriculture | AGR1010, 1060, 1090, 1110 | AGR2050, 2090 | AGR3010, 3050, 3090, 3110, 3130 |
| Career Transitions | CTR1010, 1020, 1110, 1120, 1210 | CTR2010, 2020, 2030, 2110, 2120, 2130, 2140, 2150, 2210 | CTR3010, 3020, 3030, 3110, 3120, 3130, 3150, 3210 |
| Communication Technology | COM1010, 1020, 1030 | COM2010, 2020, 2030 | COM3010, 3020, 3030 |
| Community Health | CMH1010, 1040, 1050, 1080 | CMH2010, 2020, 2030, 2050, 2070, 2080, 2090, 2100, 2110, 2120, 2130 | CMH3010, 3020, 3030, 3040, 3050, 3070, 3080, 3090, 3100, 3110, 3120, 3130 |
| Construction Technologies | | CON2190 | CON3080, 3110 |
| Design Studies | | DES2060 | DES3170, 3180 |
| Electro-Technologies | ELT1050 | ELT2050, 2060, 2070, 2080 | ELT3100, 3110 |
| Energy and Mines | ENM1010, 1100 | ENM2010, 2080, 2100 | ENM3010, 3050, 3080, 3100 |
| Enterprise and Innovation | ENT1010, 1020 | ENT2010, 2020, 2030, 2040 | ENT3010, 3020 |
| Fabrication Studies | | FAB2020 | |
| Fashion Studies | FAS1070 | FAS2010, 2020, 2040, 2140 | FAS3010, 3070, 3140 |
| Financial Management | FIN1010, 1020, 1030 | FIN2010, 2020, 2030, 2050 | FIN3010, 3020, 3030, 3040, 3060, 3070 |
| Forestry | FOR1010, 1020, 1100 | FOR2010, 2030, 2070, 2100, 2120 | FOR3010, 3060, 3070, 3080, 3120 |
| Legal Studies | LGS1010, 1020 | LGS2010, 2020, 2030, 2050 | LGS3010,3020, 3040, 3050, 3060, 3070, 3080 |
| Logistics | LOG1010 | | |
| Management and Marketing | MAM1010, 1020 | MAM2010, 2020, 2030, 2040, 2080 | MAM3010, 3020, 3030, 3040, 3050, 3060 |
| Mechanics | | | MEC3010, 3080 |
| Tourism Studies | TOU1010, 1020, 1030, 1040, 1050, 1060, 1070 | TOU2010, 2050, 2060, 2070, 2080, 2090, 2100 | TOU3030, 3040, 3050, 3060, 3080, 3090, 3100, 3110 |
| Wildlife | WLD1010, 1020, 1050 | WLD2020, 2040, 2060, 2090 | WLD3020, 3050, 3060, 3090 |



# CAREER & TECHNOLOGY STUDIES

Manual for Administrators,
Counsellors and Teachers

## Appendix 3:

# ADDRESSING HEALTH AND SAFETY IN CTS

June 1998

*The information and recommendations provided in this appendix are general in nature and do not in any way replace the expert advice required for specific circumstances.*

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## PURPOSE

This appendix serves as a reference for identifying key issues and legislation related to health and safety in CTS learning environments. It is designed to assist teachers and school system administrators to:

- understand how safety is addressed in the CTS curriculum
- review present safety practices within CTS learning environments, on- and off-campus
- develop and maintain effective health and safety programs
- plan for the design and/or upgrading of CTS learning environments
- plan professional development and inservice activities related to health and safety.

Refer to Attachment 1: Components of a Health and Safety Program.

The information included in this appendix focuses on the major components of an effective health and safety program:

- *pre-contact*—what is done to prevent or reduce accidents: safety program, safe facilities, ensuring safe practices
- *contact*—what is done when an accident occurs to reduce injury to those affected
- *post-contact*—what is done to investigate the accident and determine corrective action.

Safety programs and practices in place within schools support the implementation of CTS, as well as other school programs, such as science and physical education. As students learn to manage themselves and the tools they work with, they develop an attitude toward personal safety and the safety of others that transfers to their personal and work life as they move into adult roles. Safety awareness and practice are developed through formal instruction and by integrating safety into daily learning experiences. A successful health and safety program requires the cooperation of students and the active understanding and leadership of teachers, administrators and school boards.

As employers, school boards provide their employees and those in their care with a place to work and learn that complies with all applicable federal, provincial and municipal health and safety and environmental regulations. In addition, school boards ensure that their employees are:

- aware of their responsibilities
- aware of the hazards associated with their work
- able to carry out their work safely
- trained in measures for their own safety.

Establishing effective health and safety policies and programs requires that attention be given to facilities and equipment, instructional planning, classroom management and due diligence, and that each be considered from personal, professional and economic perspectives.

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Personal

- Opportunity—development of an individual's confidence in understanding how to act in a way to reduce accidents, how to respond efficiently and effectively if an accident should occur, and to understand rights and responsibilities related to ensuring the safety of self and others.
- Challenge—the adjustment to an individual's physical, psychological and social well-being, present and future, required when an accident occurs.

Professional

- Opportunity—development of a team that is committed to ensuring the health and safety of themselves and others.
- Challenge—the challenge for teachers to manage many variables: what students know, the tools they need to learn to use, and their interaction with others.

Economic

- Opportunity—more productive working and living environments, opportunity to reallocate resources from damage control to new initiatives that can stimulate greater economic growth.
- Challenge—the direct costs to the individual and the workplace in accident costs as well as indirect, long-term costs to the individual, family and society in reduced potential and opportunity.

## HEALTH AND SAFETY IN THE CTS CURRICULUM

The CTS curriculum addresses safety and risk management through the identification of specific elements that need to be in place to support safe learning, and through learning outcomes that require safety awareness and the demonstration of safe practices.

### HEALTH AND SAFETY AS A BASIC COMPETENCY

Refer to the *CTS Guides to Standards and Implementation*, Section A: Program Rationale and Philosophy.

Students are expected to improve their ability to demonstrate basic competencies within each strand and course. Through the task area of "managing responsibility" defined in the *Basic Competencies Reference Guide*, students are expected to identify and promote safety practices, for themselves and others. Teachers are expected to monitor and assess these behaviours in all CTS courses.

Students' performance and growth in self-management and working with others in safe environments can be assessed through observations involving the student, teacher, peers and others as they complete the requirements for a course.

## HEALTH AND SAFETY AS LEARNER OUTCOMES

Refer to the *CTS Guides to Standards and Implementation.*

Learner outcomes (learner expectations in 1997 documents) related to health and safety are integrated throughout the CTS curriculum.

Refer to the *Career Transitions Guide to Standards and Implementation.*

In addition, the following courses in the Career Transitions strand focus specifically on developing students' competency in workplace safety procedures:

- CTR1210: Personal Safety (Management)
- CTR2210: Workplace Safety (Practices)
- CTR3210: Safety Management Systems.

Refer to the *Community Health Guide to Standards and Implementation.*

Credentialling opportunities in first aid procedures are provided through courses in the Community Health strand:

- CMH2120: First Aid/CPR
- CMH2130: Sports First Aid 1
- CMH3120: First Aid/CPR for Children.

## SAFETY AS A COURSE PARAMETER

Refer to Appendix 2: Defining CTS Learning Environments—Strand and Course Parameters.

Course parameters describe the elements that need to be in place to support effective learning in a course, including facilities and equipment and instructional qualifications.

In some courses, the competencies students are developing may involve a higher risk factor, possibly because of the type of equipment or the kind of performance; e.g., doing customer work. In this event, those involved in delivering the program may require additional training in safety procedures.

## HEALTH AND SAFETY IN THE CTS LEARNING ENVIRONMENT

### PRE-CONTACT: AVOIDING ACCIDENTS/ENSURING HEALTH

**Risk Management**

Risk management involves the recognition, evaluation and control of health and safety hazards. Under provincial legislation, administration and teachers are required to take steps to recognize hazards and reduce them to a minimum.

Hazard Recognition

A health and safety hazard can be any condition or practice that has the potential to cause an illness, personal injury or damage to property. Common types of health and safety hazards found in CTS classrooms are illustrated in the following chart.

| Type of Hazard | Generally caused by: |
|---|---|
| Biological:<br>• bacteria<br>• moulds<br>• viruses<br>• parasites | poor sanitation and housekeeping practices; contact with body fluids; inadequately maintained air conditioning and heating systems |
| Chemical:<br>• flammable<br>• toxic<br>• reactive<br>• corrosive | a chemical in the form of a solid, liquid, vapour, mist or fume that can cause harm to a body organ through ingestion, absorption, inhalation or injection |
| Ergonomic:<br>• excessive force<br>• excessive repetition<br>• improper posture<br>• incorrect lighting | muscle strains/sprains; inadequate lighting; poor work station design |
| Physical:<br>• cuts/bruises<br>• fractures<br>• burns/frost bite<br>• electric shock<br>• hearing loss | excessive energy related to falling/flying objects and extreme pressure, temperatures, electrical current, radiation, noise |
| Other | work-related stress and personal issues |

The following chart identifies the CTS strands that can involve higher risk.

Refer to *Attachment 2: Health and Safety Hazard Risk in CTS Strands.*

| **CTS Strand** | **Biological** | **Chemical** | **Ergonomic** | **Physical** | **Other** |
|---|---|---|---|---|---|
| Agriculture | X | X | X | X | |
| ★ Career Transitions | | | | | |
| Communication Technology | | X | X | | |
| Community Health | X | | | | X |
| Construction Technologies | | X | X | X | |
| Cosmetology Studies | | X | X | | |
| ★ Design Studies | | | X | | |
| Electro-Technologies | | X | X | X | |
| Energy and Mines | X | X | X | X | |
| ★ Enterprise and Innovation | | | | | |
| Fabrication Studies | | X | X | X | |
| Fashion Studies | | | X | X | |
| Foods | | X | X | X | |
| Forestry | X | X | X | X | |
| Information Processing | | | X | | X |
| Logistics | | | X | X | |
| Management and Marketing | | | | X | |
| Mechanics | | X | X | X | |
| ★ Tourism Studies | | | | | |
| ★ Wildlife | | | | | |

★ Varies according to type of program and off-campus experience.

Hazards can be identified through:

- formal and informal lab inspections
- analysis of accidents or near-misses
- task analysis
- product labels and information sheets
- equipment and tool manufacturers' recommendations
- concern expressed by students when involved in a specific task.

As a matter of policy, every student should be taught to recognize and report hazards associated with his or her work and take the necessary precautions to prevent an accident from occurring.

Refer to Attachment 3: Sample Health and Safety Checklist.

One of the most effective ways of identifying unsafe conditions is through regular classroom/lab inspections. These inspections help to identify:

- housekeeping concerns
- equipment problems
- issues related to lighting, heating and ventilation
- changes in procedures that may have a negative impact on health and safety
- corrections that should have already been made.

Accidents are by their very nature disruptive and may or may not cause injury or damage to property. Students may not report incidents where no injury or damage to property occurs. However, these near-misses are potential future accidents and therefore should be monitored and corrected on an ongoing basis.

The analysis of lab procedures is a process that examines the interaction between the students, the environment in which they work, and the equipment and materials they use. The results of this assessment enable teachers to:

- determine the level of knowledge and skills that a student requires to complete a given task, process or operation safely
- identify substandard acts and conditions and determine effective control measures to:
  - modify student behaviour
  - modify lab/shop conditions or procedures.

### Hazard Evaluation

Hazard evaluation is the process used to prioritize an identified hazard to ensure that appropriate action will be taken. Hazards deemed most dangerous should be dealt with first. Consideration should be given to:

- the short- and long-term effects on teachers and students
- ways to remove the hazard
- methods to protect persons from harm
- reducing or eliminating a person's exposure time.

### Hazard Control

Besides being able to recognize and evaluate hazards, risks can be further minimized through hazard control. Hazard control can be accomplished in the classroom through effective:

- administrative controls—controls that deal primarily with policies and regulations, classroom supervision and instruction. In a well-managed classroom, the teacher's efforts are directed toward:
  - providing adequate instruction on lab routines, job procedures and equipment operation
  - identifying and establishing sanitary practices
  - planning safe event sequences
  - scheduling work to avoid overcrowding
  - identifying and securing materials that are less toxic and harmful to the student and environment

  - locating and ordering equipment that meets or exceeds accepted standards of safety

Refer to Attachment 4: Engineering Controls.

- engineering controls—controls that focus on systems that physically remove hazardous materials or provide protection from a known hazard. These controls address practices that may involve the use of ventilation systems, dust and fume extraction equipment and machine guards

Refer to Attachment 5: Personal Protective Equipment.

- personal protective equipment—clothing and equipment worn to minimize the risk of illness or injury through protection of the eye/face, hearing, head/hair, foot, hand and/or respiratory system. Points to consider when selecting and using personal protective equipment include:
  - matching the type and design features of the equipment with the type and extent of the hazard
  - identifying equipment that does not interfere with the student's performance
  - using equipment that is approved and easily maintained.

Personal protective equipment should not take the place of control techniques, such as substituting a less hazardous product for a more hazardous one, exhausting dangerous fumes, extracting dust particles and guarding equipment.

Refer to Attachment 6: Workplace Hazardous Materials Information System.

Strategies for hazard control in the school also need to address chemical management. The Workplace Hazardous Materials Information System (WHMIS) is a system to ensure that workers are provided with complete and accurate information regarding hazardous products they use, and to ensure that the information is used to provide safe working conditions. As all workers in the school environment are responsible for WHMIS requirements, related policy and information are pertinent to:

- school administrators
- teachers, especially in science, CTS and art
- aides and assistants in those subject areas
- cleaning and facility operations staff
- secretarial and clerical staff.

Although students are not considered workers in the school environment. it is important they become knowledgeable and follow WHMIS provisions.

Refer to Attachment 7: Transportation of Dangerous Goods.

Of further significance when planning for hazard control is the *Transportation of Dangerous Goods Act*, legislated to promote public safety when dangerous goods are handled, offered for transport, or transported in Canada. All persons who handle, offer for transport or transport dangerous goods must meet the TDG Regulation requirements.

The dangerous goods most likely to be transported by school system vehicles and personnel include chemical materials for instructional purposes, cleaners and other janitorial products, solvents and petroleum products, paints, and assorted chemical wastes. The following

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school-based personnel should be knowledgeable regarding TDG Regulations:

- school administrators
- teachers responsible for technical areas
- lab technicians
- facility operators.

**Emergency Preparedness**

The impact of an accident can be greatly reduced through effective planning. In addition, planning also ensures that the resources required to deal with an unexpected situation are available.

Students and teachers in CTS programs must be prepared to respond to an emergency. An effective emergency response plan should include:

- a clearly defined and understood set of procedures
- prominently posted local emergency telephone numbers
- identification and location of external assistance procedures
- an evacuation plan in the event of a fire, chemical spill or gas leak
- easily accessed first-aid supplies
- knowledge and practice in applying first-aid techniques.

First-Aid Response Plan

In accordance with School Board Policy, each school should develop a First-Aid Response Plan appropriate to the acute illnesses or injuries that may occur on school property. This plan should enable CTS teachers to:

- identify those acute injuries or illnesses that may occur in specific areas of responsibility.
  *This information will be based on the type of work being done in the area, and on types and frequencies of previous injuries or illnesses.*
- understand their roles and responsibilities for addressing safety issues.
  *Everyone in the school needs to know his or her role in putting the First-Aid Response Plan into practice.*
- identify training opportunities appropriate to the acute injuries or illnesses that may occur. At minimum, this training should result in the instructor having readily available access to competent first-aid help.
  *The training needed varies with the needs of the particular CTS area. Schools located far from other emergency services need to have people with the extra skills necessary to stabilize an injured person for travel to an acute care hospital.*
- provide their areas with first-aid response equipment appropriate to the acute injuries or illnesses that may occur, and the proximity to other emergency services. As a minimum, a basic first-aid kit, containing the equipment specified by the First-Aid Training and Standards Agency, would be required.
  *First-aid response equipment varies considerably according to the needs of a particular CTS function. A minimum expectation would be that all work sites have some type of basic first-aid kit. In areas remote from services, the expectation would be on the school to*

*provide the equipment needed to respond to first-aid emergencies.*

- become familiar with the location and content of the school's First-Aid Response Plan, especially with regard to the specific procedures on how to respond to those acute illnesses or injuries that may occur.
  *First-aid response procedures detail the action steps required to deal with the immediate emergency. Schools can contact their local Health Authority for assistance.*
- keep written records of acute injuries or illnesses that occur in their areas of responsibility. At minimum, the records should include name of person, name and qualifications of person giving first aid, time of injury, description of injury, location and description of injury cause, and actions taken to prevent recurrence. Records should be kept for three years.
  *Records are necessary to provide data for program review.*
- review their CTS first-aid response capabilities every three years, or whenever there are significant changes in the operating conditions in the CTS work area.
  *First-aid response capabilities in CTS need to be reviewed to ensure their effectiveness and to identify opportunities for improvement. The intent here would be to allow some flexibility in how the CTS instructor accomplishes this task, but at the same time ensure that some type of review is carried out.*

Fire Prevention and Suppression

There is a higher risk of a fire starting in a CTS facility than in other program areas because of the nature of many CTS activities. Fuels such as paper, plastic, wood, paint, oily rags, cleaning solvents and oxidizing agents that support combustion are often found in CTS labs. Conditions that can cause ignition, including electrical equipment, heating devices, open flames and sparks are also present in many CTS programs.

Fires can be prevented by eliminating the fuel source and sources of ignition through good housekeeping, proper storage of materials and appropriate use of equipment.

Not all fires have the same characteristics; therefore it is important to know the class of fire and the recommended type of fire extinguisher.

- Class A fires are associated with common materials such as wood, paper, rubber and most plastics. This class of fire can be extinguished by bringing the temperature of the burning materials below the ignition point using water or by the blanketing and smothering effects of a dry chemical or carbon dioxide extinguisher.
- Class B fires are associated with a flammable liquid, gas and grease. This class of fire is best extinguished by limiting the air that supports the fire. Dry chemicals, carbon dioxide and foam agents are recommended for this class of fire. Water, unless it is a form of mist, is not recommended because it tends to spread the fire.

- Class C fires are mainly caused by the misuse of electrical equipment and/or electrical failures. The first step in extinguishing this type of fire is to shut off the electrical supply. Only extinguishers with a class C rating are recommended to be used with this type of fire.
- Class D fires occur when combustible metals such as magnesium, powdered aluminum and zinc are ignited. Dry sand or a class D extinguisher can be used to exclude air.

Release of Hazardous Materials

Owing to possible damage to the environment and risk of danger to the health and safety of others, a plan should be in place to deal with the release of hazardous materials.

If a large spill occurs off-campus, those involved are required to immediately report the accident to proper authority, generally by contacting the Pollution Emergency Response Team at 1–800–222–6514 or by calling 911.

Smaller spills that may occur in a lab or shop should be confined and cleaned up as soon as possible. To do this, a conveniently located clean-up kit is recommended. A kit of this nature should include the following material and equipment:

- bag of granular absorbent
- damming materials
- neutralizing agents
- garbage bags
- plastic garbage cans
- goggles and respirator
- latex gloves, coveralls and rubber boots
- broom and dustpan.

## CONTACT: EMERGENCY RESPONSE TO AN ACCIDENT

**Response to Injury**

In the event of an accident, it is important to act quickly yet take time to evaluate the extent of the injury/accident and the potential for further damage to personnel or property. When an accident occurs:

- take control of the situation through effective management techniques
- ensure that any injured person(s) is cared for
- ensure that no further injury or damage occurs
- proceed to get help.

**Response to Hazardous Materials Spills**

In the event of a serious spill, alert others, get away from the area and report the accident to the proper authorities by calling 911 or the fire department.

For smaller spills:

- secure the area
- keep others away from the spill
- get assistance
- contain the spill
- clean up the spill.

Before attempting a clean up, check the Material Safety Data Sheet for recommended procedures. It should be noted that all cleaned up materials, contaminated absorbent and clothing should be treated the same way as the spilt material and disposed of similarly in a clearly marked container.

**Response to Fire**

A typical response to a fire would include:

- if visible fire or smoke is detected, evacuate the area and isolate the fire by closing the doors
- have someone notify the teacher or administration
- pull the nearest fire alarm
- if the fire is small and contained, attempt to extinguish it using the appropriate fire extinguisher.

**Response to Natural Gas or Propane Leak**

Because propane is heavier than air a leak may spread into a ventilation or sewer system. If the gas should ignite, the fire could spread rapidly and cause an explosion in a confined space. When a leak is detected:

- evacuate the area
- locate and stop the leak if possible
- do not operate any electrical equipment
- notify the appropriate staff person
- remove any victims to fresh air and apply CPR if necessary.

## POST-CONTACT: ACCIDENT INVESTIGATION AND REPORTING

The major purpose of an investigation is not to attach blame but to identify the causes of an accident or potentially hazardous event so that corrective measures can be taken to prevent similar events in the future.

When investigating an accident, the investigator needs to:

- get an overall view of what happened
- identify the circumstances that contributed to the accident
- examine physical evidence, such as equipment and material

- take photographs and/or collect and safeguard any physical evidence, if warranted
- talk to people directly involved and/or witnesses. Obtain written statements, if appropriate
- identify causes, and determine corrective action
- maintain records of incidents and corrective measures in keeping with board/school policy.

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## SOURCES OF SUPPORT: REGULATORY, MONITORING, CONSULTING

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Refer to Attachment 8: Overview of Legislation and Key Players Related to Health and Safety in CTS Programs.

### LEGISLATION AND REGULATIONS

The health and safety of individuals and the environment is protected by law. All workers have the right to know about the hazardous materials they may come in contact with, to be protected from injury and to receive proper care and attention if they do become involved in an accident.

### KEY PLAYERS: ROLES AND RESPONSIBILITIES

To ensure that there is an effective health and safety program in place requires the cooperation and support of all those responsible for the learning environment, development of curriculum and delivery of instruction. This involves the education community as well as various government departments and agencies who have responsibility for various aspects of health and safety.

Alberta Education:

- works cooperatively with school boards in the development of school safety policies and guidelines
- creates legislation as required and provides information explaining relevancy of legislation to the school
- identifies activities within the curriculum that may be hazardous.

School Boards:

- formulate safety policies in conjunction with the appropriate education professionals
- adopt safety policy statements consistent with regulations and codes
- facilitate the implementation of safety policies
- request and/or direct safety and health investigations
- provide for, and administer, adequate funding for the provision of a healthy and safe environment
- ensure that the requirements of various agencies such as Occupational Health and Safety Division, Fire Commissioner and Building Standards, are carried out in schools and other work sites under their jurisdiction

- provide appropriate materials and equipment to maintain adequate standards of health and safety
- establish procedures to monitor safety policies and direct investigations as required.

Superintendents:

- formulate and implement school board policies
- communicate School Board policies, especially the minimum standards, to staff, students, parents and the public
- establish a system to monitor the effectiveness of safety policies and practices in the schools
- initiate corrective action as required
- implement an appeal system that extends beyond the local environment to governmental agencies that may result in local or government intervention
- ensure that in each school there is one certified teacher and one support staff trained in first aid and emergency care.

School Administrations:

- provide for educational programs and resources that assist in the development of good safety practices and attitudes
- appoint one person to be responsible for the coordination of health and safety programs and resources in the school
- maintain accurate records of accidents at school and the treatment provided
- provide direction and support to teachers regarding student safety supervision and/or violations
- identify potentially hazardous conditions and ensure that safe practices and procedures are in place to correct them
- ensure school representation on safety committees, who would be involved in safety inspections
- conduct and/or facilitate regular safety inspections
- ensure that teachers provide safety instruction as required in the courses they teach
- report accidents to the school board and the Workers' Compensation Board, as required.

Instructional Staff:

- assume responsibility for protecting their own health and safety and that of the students under their charge
- model safe behaviour in teaching practices and procedures
- accept as a professional obligation responsibility for providing and emphasizing safety education in the classroom
- implement safety education programs in accordance with school board policies and the regulations and standards of other regulating bodies

- evaluate safety education efforts, monitor student behaviour, and initiate corrective action as required
- identify unsafe environment conditions and correct or report these in writing.

Students:

- are knowledgeable in both environment safety factors and safe behavioural practices
- should conduct themselves in accordance with established safety practices and rules, such as appropriate dress and protective clothing
- should identify unsafe practices or environmental conditions and report these to the school staff
- should inform school staff of the possible health concerns relevant to their personal safety and protection.

Parents:

- should inform the school about relevant student medical problems
- should inform the school if they wish their child to be excluded from particular course activities that may be potentially hazardous.

## DUE DILIGENCE

Due diligence implies that everything reasonably possible is being done to ensure the health and safety of students, teachers and the environment. Essentially, due diligence is achieved through constant monitoring and compliance with local policies and government regulations.

Refer to Attachment 9: Due Diligence in the CTS Classroom.

Elements of a safety program include:

- establishing clearly defined policies, practices and procedures
- monitoring procedures to ensure that safe policies, practices and procedures are being followed
- communicating information on issues related to health and safety
- auditing/inspecting the learning environment
- training in issues related to health and safety
- investigation and reporting of accidents.

**Attachment 1**

## Components of a Health and Safety Program

### PRE-CONTACT: Avoiding Accidents/ Ensuring Health

What is done to prevent or reduce accidents:
- ensuring a safe environment
- ensuring safe practices and procedures
- providing training.

### CONTACT: Emergency Response to an Accident

What is done when an accident or incident occurs; includes emergency response to:
- injury
- chemical spill
- fire
- gas leaks.

### POST-CONTACT: Accident Investigation and Reporting

What is done to investigate an accident/incident and determine corrective action:
- investigation
- observation
- documentation
- reporting
- identification of corrective action.

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Attachment 2

## Health and Safety Hazard Risks in CTS Strands

| | PHYSICAL | | | | | | | | | | CHEMICAL | | | | | | | | | | | | BIOLOGICAL | | | | ERGONOMIC | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **STRANDS:** | Noise | Temperature Extremes | Radiation | Lifting | Heights/Falls | Caught Between/Under | Electric Shock | Caught in Equipment | Struck by Moving Object | Fire and Explosion | Welding/Solder Fumes | Paints | Wood Dusts | Silica and Abrasive Dust | Asbestos | Solvents and Cleaners | Lab Chemicals | Adhesives | Liquid Fuels and Coolants | Pesticides/Herbicides | Fiberglass/Resins | Gases | Bacteria/Viruses | Parasites | Mould/Fungi | Plants/Pollen | Excessive Force | Excessive Repetition | Improper Posture | Incorrect Lighting |
| Agriculture | █ | ▓ | █ | ▓ | | ▓ | ▒ | █ | █ | ▒ | ▒ | | | ▒ | | ▒ | █ | | ▓ | █ | | ▓ | ▓ | ▓ | ▓ | █ | ▓ | █ | ▓ | |
| Career Transitions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Communication Technology | ▒ | | | | | ▒ | | | | | | | | | | | ▓ | ▒ | | | | | | | | | | ▓ | ▓ | ▒ |
| Community Health | | | | | ▓ | | | ▓ | | | | | | | | | | ▒ | | | | | ▓ | ▓ | ▓ | | | | ▓ | |
| Construction Technologies | █ | | | ▓ | ▓ | ▓ | ▒ | ▓ | | ▒ | | | █ | ▓ | | ▒ | | █ | | | ▒ | | | | | | █ | ▓ | ▒ | |
| Cosmetology Studies | | | | ▒ | | | | | | | | | | | | ▒ | | | | | | | | | | | | | ▒ | ▒ |
| Design Studies | ▒ | | | | | | | ▒ | | | | | | | | | | ▒ | | | | | | | | | | ▒ | ▒ | ▒ |
| Electro-Technologies | ▒ | ▓ | ▒ | ▒ | | ▒ | █ | | ▒ | ▒ | █ | | | | | ▓ | ▒ | ▒ | | | | | | | | | | ▒ | ▒ | ▒ |
| Energy and Mines | █ | ▓ | ▓ | ▓ | ▓ | ▓ | ▒ | █ | █ | █ | ▒ | | | ▓ | | ▒ | ▓ | | ▓ | | | ▓ | ▒ | ▒ | ▒ | ▒ | █ | ▓ | ▓ | |
| Enterprise and Innovation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fabrication Studies | █ | ▓ | ▓ | ▒ | ▒ | █ | ▒ | █ | ▓ | ▓ | █ | ▒ | | ▓ | | | | | | | | ▓ | | | | | █ | █ | ▓ | ▒ |
| Fashion Studies | | ▓ | | | | █ | ▒ | █ | | | | | | | | | | | | | | | | | | | | | ▒ | ▒ |
| Financial Management | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Foods | | █ | ▒ | | | ▓ | ▓ | ▓ | | █ | | | | | | ▒ | | | ▒ | | | ▒ | █ | | | | | | | |
| Forestry | | ▓ | █ | ▒ | ▒ | ▒ | | ▓ | ▓ | ▒ | | | ▒ | | | ▒ | ▓ | | ▓ | █ | | ▒ | ▒ | ▒ | ▓ | █ | ▓ | █ | ▓ | |
| Information Processing | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Legal Studies | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Logistics | | ▒ | | ▓ | | | ▓ | █ | ▓ | ▒ | ▒ | ▒ | ▒ | ▒ | ▒ | ▒ | ▒ | ▒ | ▒ | ▒ | ▒ | ▒ | ▒ | ▒ | ▒ | ▒ | ▒ | ▒ | ▒ | ▒ |
| Management and Marketing | | | | | | | | ▒ | | | | | | | | | | | | | | | | | | | | | | |
| Mechanics | ▒ | ▓ | | █ | ▓ | ▓ | ▒ | ▓ | ▒ | █ | ▒ | ▒ | | ▓ | █ | █ | | ▓ | █ | █ | █ | █ | | | | | █ | ▒ | ▒ | ▒ |
| Tourism Studies | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ▒ | ▒ |
| Wildlife | | ▓ | ▓ | ▒ | ▒ | ▒ | | ▒ | ▒ | ▒ | | | | | | | ▓ | | ▓ | | | ▒ | ▒ | ▒ | ▓ | █ | ▒ | ▒ | ▓ | |

Level of Risk: ▒ Low Risk ▓ Medium Risk █ High Risk

## Sample Health and Safety Checklist

School: ______________________________

Program: ____________________ Facility: ____________________

Inspection made by: ____________________ ____________________
Please Print Name Position

Signature: ____________________ Date: ____________________

General Questions:

1. Who is responsible for the health and safety program in this facility? ____________________ Administrator ____________________ Teacher(s)

2. Has a previous written safety inspection been made of this facility: Yes ☐ No ☐

3. If Yes, by whom? ____________________

4. Date of that inspection. ____________________

5. Have the recommendations of that inspection been carried out? If not, indicate the status of those exceptions below: All ☐ Some ☐ None ☐

| Date Identified | Concern(s) | Corrective Action(s) and Anticipated Completion Date |
|---|---|---|
| | | |
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| | | |

## Hazard Identification and Control

To identify the health and safety hazards in the learning environment is one of the most important components of a health and safety program. The individual or team that carries out this inspection should carefully evaluate the condition and appropriateness of all facilities, work areas, equipment and instructional procedures. Each unsafe act or condition should be noted and a recommendation to correct or remove the hazard be provided. Since the learning environment is not static, it is essential that ongoing vigilance and control of health and safety hazards continue.

## Checking Procedure

Draw a ○ around the appropriate number using the following rating scale:

| Satisfactory | | | Unsatisfactory | | |
|---|---|---|---|---|---|
| 4 | 3 | 2 | 1 | 0 | N/A |

Action required should be identified in all instances where a number of 2 or less is circled. Space is provided at the end of each topic for such comments.

## Section I: Facilities

### A. Housekeeping

| Evaluate the condition of: | Satisfactory | | | Unsatisfactory | | |
|---|---|---|---|---|---|---|
| 1. walls, windows and ceiling; e.g., clean, free of chips and cracks | 4 | 3 | 2 | 1 | 0 | N/A |
| 2. floors, aisles and stairs; e.g., clean and free of obstructions | 4 | 3 | 2 | 1 | 0 | N/A |
| 3. student work stations; e.g., benches, tables and desks | 4 | 3 | 2 | 1 | 0 | N/A |
| 4. shelves, tool and material storage areas | 4 | 3 | 2 | 1 | 0 | N/A |
| 5. bulletin boards and display cases | 4 | 3 | 2 | 1 | 0 | N/A |
| 6. washing and changing facilities | 4 | 3 | 2 | 1 | 0 | N/A |
| 7. waste disposal areas and containers (incompatible materials should not be allowed to come in contact with each other) | 4 | 3 | 2 | 1 | 0 | N/A |
| 8. power panel and gas meter areas; e.g., free of obstructions and combustible materials | 4 | 3 | 2 | 1 | 0 | N/A |
| 9. other: ______________________________ | 4 | 3 | 2 | 1 | 0 | N/A |

Comments (concerns, required actions, recommendations):

________________________________________________________________

________________________________________________________________

________________________________________________________________

________________________________________________________________

## B. General Conditions

| Evaluate the provision for/condition of: | Satisfactory | | | Unsatisfactory | | |
|---|---|---|---|---|---|---|
| 1. clearly marked and accessible exits | 4 | 3 | 2 | 1 | 0 | N/A |
| 2. emergency lighting | 4 | 3 | 2 | 1 | 0 | N/A |
| 3. safety treads and railings on stairs | 4 | 3 | 2 | 1 | 0 | N/A |
| 4. safety zone markers around hazardous equipment | 4 | 3 | 2 | 1 | 0 | N/A |
| 5. non-skid floor surfaces in front of machines | 4 | 3 | 2 | 1 | 0 | N/A |
| 6. air quality (general ventilation, fume extraction and dust control systems) | 4 | 3 | 2 | 1 | 0 | N/A |
| 7. lighting direction and levels | 4 | 3 | 2 | 1 | 0 | N/A |
| 8. noise levels | 4 | 3 | 2 | 1 | 0 | N/A |
| 9. other: ______________________ | 4 | 3 | 2 | 1 | 0 | N/A |

Comments (concerns, required actions, recommendations):

## C. Electrical Supply

| Evaluate provision for/condition of: | Satisfactory | | | Unsatisfactory | | |
|---|---|---|---|---|---|---|
| 1. electrical outlets (outlets should not be overloaded) | 4 | 3 | 2 | 1 | 0 | N/A |
| 2. power panel breakers and circuit identification | 4 | 3 | 2 | 1 | 0 | N/A |
| 3. master control and emergency shut-off switches | 4 | 3 | 2 | 1 | 0 | N/A |
| 4. electrical conduit, cables, connections and extension cords | 4 | 3 | 2 | 1 | 0 | N/A |
| 5. high voltage signage | 4 | 3 | 2 | 1 | 0 | N/A |
| 6. explosion proof switches and fixtures; e.g., paint room | 4 | 3 | 2 | 1 | 0 | N/A |
| 7. other: ______________________ | 4 | 3 | 2 | 1 | 0 | N/A |

Comments (concerns, required actions, recommendations):

### D. Gas Supply

Evaluate the provisions for/condition of:

| | Satisfactory | | | Unsatisfactory | | |
|---|---|---|---|---|---|---|
| 1. gas lines, valves, regulators and colour coding | 4 | 3 | 2 | 1 | 0 | N/A |
| 2. lighting instructions for gas-fired equipment and appliances | 4 | 3 | 2 | 1 | 0 | N/A |
| 3. pilot lights and/or electronic ignition systems | 4 | 3 | 2 | 1 | 0 | N/A |
| 4. fire guards between gas appliance and equipment and adjacent walls, benches and other combustible materials | 4 | 3 | 2 | 1 | 0 | N/A |
| 5. combustion air supply | 4 | 3 | 2 | 1 | 0 | N/A |
| 6. other: ______________________ | 4 | 3 | 2 | 1 | 0 | N/A |

Comments (concerns, required actions, recommendations):

________________________________________________

________________________________________________

## Section II: Furniture and Equipment

### A. Lab Furniture and Equipment

The furniture/equipment is:

| | Satisfactory | | | Unsatisfactory | | |
|---|---|---|---|---|---|---|
| 1. arranged to provide maximum safety to the operator and other students | 4 | 3 | 2 | 1 | 0 | N/A |
| 2. properly adjusted and secured to floor, bench or cart | 4 | 3 | 2 | 1 | 0 | N/A |
| 3. guarded at all exposed points of operation | 4 | 3 | 2 | 1 | 0 | N/A |
| 4. controlled easily (switches and levers accessible) | 4 | 3 | 2 | 1 | 0 | N/A |
| 5. provided with dust extraction or ventilation where required | 4 | 3 | 2 | 1 | 0 | N/A |
| 6. provided with working surfaces appropriate to the tasks performed; e.g., electrical work should not take place on a metal surface | 4 | 3 | 2 | 1 | 0 | N/A |
| 7. serviced and maintained on a regular basis | 4 | 3 | 2 | 1 | 0 | N/A |
| 8. provided with electromagnetic switches where required; e.g., drill press, table saw, wood and metal lathes | 4 | 3 | 2 | 1 | 0 | N/A |
| 9. CSA approved (applies to all electrical equipment) | 4 | 3 | 2 | 1 | 0 | N/A |
| 10. properly grounded or double insulated | 4 | 3 | 2 | 1 | 0 | N/A |
| 11. other: ______________________ | 4 | 3 | 2 | 1 | 0 | N/A |

Comments (concerns, required actions, recommendations):

________________________________________________

________________________________________________

## B. Fire Protection

Evaluate:

| | Satisfactory | | | Unsatisfactory | | |
|---|---|---|---|---|---|---|
| 1. emergency exit routes and signage | 4 | 3 | 2 | 1 | 0 | N/A |
| 2. proper type, location and service records of fire extinguishers | 4 | 3 | 2 | 1 | 0 | N/A |
| 3. provision and use of fireproof pads under electric irons, hot plates and other portable heating devices | 4 | 3 | 2 | 1 | 0 | N/A |
| 4. type of storage of chemicals and flammable materials | 4 | 3 | 2 | 1 | 0 | N/A |
| 5. storage of oily rags and other combustible materials | 4 | 3 | 2 | 1 | 0 | N/A |
| 6. placement and condition of smoke detectors and/or heat sensors | 4 | 3 | 2 | 1 | 0 | N/A |
| 7. condition and use of heat fuses (used in conjunction with extinguishing system and parts washer lids) | 4 | 3 | 2 | 1 | 0 | N/A |
| 8. other: ______________________________ | 4 | 3 | 2 | 1 | 0 | N/A |

Comments (concerns, required actions, recommendations):

## C: Personal Protective Equipment

Evaluate provision for/condition of:

| | Satisfactory | | | Unsatisfactory | | |
|---|---|---|---|---|---|---|
| 1. appropriate eye protection; e.g., face shields, goggles and safety glasses | 4 | 3 | 2 | 1 | 0 | N/A |
| 2. hand protection; e.g., rubber gloves, leather gauntlets and heat-resistant gloves | 4 | 3 | 2 | 1 | 0 | N/A |
| 3. foot protection; e.g., safety shoes and toe caps | 4 | 3 | 2 | 1 | 0 | N/A |
| 4. head covering/protection; e.g., hats, hair nets, hard hats and bump caps | 4 | 3 | 2 | 1 | 0 | N/A |
| 5. respiratory protection; e.g., dust, paint and spray masks | 4 | 3 | 2 | 1 | 0 | N/A |
| 6. protective clothing; e.g., aprons, gowns, smocks and leggings | 4 | 3 | 2 | 1 | 0 | N/A |
| 7. hearing protection; e.g., ear plugs and muffs | 4 | 3 | 2 | 1 | 0 | N/A |
| 8. other: ______________________________ | 4 | 3 | 2 | 1 | 0 | N/A |

Comments (concerns, required actions, recommendations):

### D. First-Aid Equipment

Evaluate availability/condition of:

| | Satisfactory | | | Unsatisfactory | | |
|---|---|---|---|---|---|---|
| 1. first-aid kit | 4 | 3 | 2 | 1 | 0 | N/A |
| 2. eye wash station | 4 | 3 | 2 | 1 | 0 | N/A |
| 3. emergency shower | 4 | 3 | 2 | 1 | 0 | N/A |
| 4. first-aid information | 4 | 3 | 2 | 1 | 0 | N/A |
| 5. fire blanket | 4 | 3 | 2 | 1 | 0 | N/A |
| 6. other: ______________________ | 4 | 3 | 2 | 1 | 0 | N/A |

Comments (concerns, required actions, recommendations):

## Section III: Instructional Program

### A. Posted Information

Evaluate:

| | Satisfactory | | | Unsatisfactory | | |
|---|---|---|---|---|---|---|
| 1. use of bulletin boards, health and safety posters and student reports | 4 | 3 | 2 | 1 | 0 | N/A |
| 2. suitability and type of safety instruction posted at each machine | 4 | 3 | 2 | 1 | 0 | N/A |
| 3. emergency response procedures and postings | 4 | 3 | 2 | 1 | 0 | N/A |
| 4. availability of important telephone numbers and contact people to be used in the event of an accident or injury | 4 | 3 | 2 | 1 | 0 | N/A |
| 5. other: ______________________ | 4 | 3 | 2 | 1 | 0 | N/A |

Comments (concerns, required actions, recommendations):

## B. Handling Materials/Goods

| Evaluate: | Satisfactory | | | Unsatisfactory | | |
|---|---|---|---|---|---|---|
| 1. instruction on the use of hazardous materials (WHMIS) | 4 | 3 | 2 | 1 | 0 | N/A |
| 2. availability and maintenance of Material Safety Data Sheets | 4 | 3 | 2 | 1 | 0 | N/A |
| 3. labels on controlled product containers | 4 | 3 | 2 | 1 | 0 | N/A |
| 4. methods used to dispose of hazardous materials | 4 | 3 | 2 | 1 | 0 | N/A |
| 5. material lifting and handling instructions and procedures | 4 | 3 | 2 | 1 | 0 | N/A |
| 6. procedures used to transport dangerous goods | 4 | 3 | 2 | 1 | 0 | N/A |
| 7. personal hygiene related to customer service; e.g., hair nets, plastic gloves and hand washing | 4 | 3 | 2 | 1 | 0 | N/A |
| 8. other: ______________________ | 4 | 3 | 2 | 1 | 0 | N/A |

Comments (concerns, required actions, recommendations):

## C. Record Keeping

| Evaluate: | Satisfactory | | | Unsatisfactory | | |
|---|---|---|---|---|---|---|
| 1. documentation of safety lesson plans and presentations | 4 | 3 | 2 | 1 | 0 | N/A |
| 2. records of student attendance | 4 | 3 | 2 | 1 | 0 | N/A |
| 3. records of student safety tests and results | 4 | 3 | 2 | 1 | 0 | N/A |
| 4. reporting mechanisms for accidents and injuries | 4 | 3 | 2 | 1 | 0 | N/A |
| 5. records of follow-up measures | 4 | 3 | 2 | 1 | 0 | N/A |
| 6. records of facility and program inspection | 4 | 3 | 2 | 1 | 0 | N/A |
| 7. records of requests for facility/equipment improvements | 4 | 3 | 2 | 1 | 0 | N/A |
| 8. other: ______________________ | 4 | 3 | 2 | 1 | 0 | N/A |

Comments (concerns, required actions, recommendations):

## Summary of Recommendations

Identify and rank concerns that may place students and teachers in immediate danger.

Efforts should first be directed toward correcting those problems that have the most serious consequence and highest probability of occurrence, followed by those that are less hazardous.

| Item No. | Concerns | Required Actions |
|---|---|---|
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Signature: ______________________

Date: ______________________

## Engineering Controls

### Ventilation

In accordance with government regulations, where there exists a reasonable possibility that a health or safety hazard exists from the production or dissemination of an airborne contaminant, ventilation is to be in place such that these hazards are controlled.

In determining whether a ventilation system is needed, the following points should be considered:

- concentrations of the airborne contaminants in comparison with the maximum allowable limits set by Alberta Labour, Occupational Health and Safety (Chemical Hazards Regulation)
- physical, chemical and toxicological properties of the contaminants
- flammability and explosivity of the contaminants
- location of the students or staff in relation to the sources
- oxygen content of the air
- duration of the exposure of the workers
- sources and concentrations of the contaminants; e.g., dust and fumes.

### Dust and Fume Extraction

*Dust and fume extraction equipment should be engineered to operate with the least amount of noise and vibration.*

Dust and fume extraction should take place as close to the source as is possible to avoid spreading the contaminates or fumes throughout the work environment. Processes that typically require dust/fume extraction include:

- cooking
- foundry
- welding and soldering
- woodworking.

### Machine Guards

*Well-engineered guards should not interfere with the safe operation of the equipment.*

Guards are installed on equipment to protect the operator from rotating parts, flying chips, sparks, high temperatures and operating points. At no time should fixed guards be removed or mechanisms locked out. Types of guards and guarding mechanisms include:

- complete enclosures around belts and pulleys
- movable guards as found on table saw or jointer
- fixed guard around a grindstone
- covers in place at the point of operation
- interlocking devices requiring both hands to be used as in the operation of a paper cutter
- automatic shut off used in connection with a washer/dryer lid or door and computer numerical control (CNC) lathe/mill cover.

## Personal Protective Equipment

Often the only practical way to minimize the risk of illnesses or injury is to use Personal Protective Equipment (PPE).

### Clothing

Clothing may provide a defence against injury. Many lab processes require students to wear aprons, smocks or coveralls over their regular clothing. Where there is the possibility of becoming caught in moving parts or exposure to fire, students **should not** be permitted to wear:

- loose fitting or torn clothing
- garments made from flammable materials
- exposed jewelry
- long, loose hair.

### Eye/Face Protection

For more information, refer to Alberta Labour "Eye Injury Prevention in Industry," 1994.

Any operation that presents a risk of injury to the eyes or face requires the use of approved eye/face protection equipment. This PPE is designed to protect individuals against:

- flying objects, sparks and particles
- splashing liquids and molten metal
- intense heat
- ultraviolet, infrared and visible radiation.

A variety of eye and face protection devices are available. They include:

- safety glasses equipped with side shields to offer protection from impact
- goggles that are vented to protect the eyes and a portion of the face
- goggles that are nonvented to protect against impact and chemical splashes
- welding goggles to protect against radiation and impact
- welding helmets to protect the eyes and face from radiation and impact
- face shields to protect the whole face; these should also be supplemented with safety glasses.

### Hearing Protection

For more information, refer to CSA Standards "Hearing Protection," Z94.2-94.

Noise from some operations may cause hearing loss.

Students and teachers should not be exposed to a sound level that exceeds 85 dB on average for an eight-hour day unless some form of hearing protection is used. It is at decibel levels 85 and above that the chances of noise-induced hearing loss begins to increase. Examples of noise levels produced by common tools and the occupation exposure limits are outlined in the following chart.

*Noise Levels*★

| Machine | Decibel Level | Max Hours/Days of Exposure |
|---|---|---|
| Bandsaw | 95 | 2 |
| Chain saw | 100 | 1 |
| Circular saw | 105 | 1/2 |
| Dust collector | 95 | 2 |
| Jointer | 90 | 4 |
| Lawn mower | 95 | 2 |
| Metal lathe | 80 | 16 |
| Router | 105 | 1/2 |
| Thickness planer | 105 | 1/2 |

★ Actual levels vary according to the design of the equipment. For example, belt driven equipment tends to be less noisy than gear driven.

To reduce or eliminate the risk of injury owing to sudden or continuous noise levels, the appropriate precautions should be taken, by using hearing protection and/or limiting exposure time. The most common types of hearing protection used in CTS programs are earplugs and earmuffs.

**Head Protection**

For more information, refer to CSA Standards "Industrial Protective Headwear," Z94.1–92.

On many job sites and activities, safety headwear is required to protect the head from falling objects, bumps, splashes or energized objects. Headwear must meet CSA requirements and job site recommendations. It should be noted that bump caps are not considered to be helmets and can only be used where there is little risk from falling objects.

**Foot Protection**

Safety footwear is designed to protect against impact, compression and puncture injuries. Safety footwear can be purchased in a variety of styles and grades indicated by coloured tags and symbols. The colour of the tag indicates the amount of resistance the toe will support against different weights dropped from varying heights. In construction, a green triangle is recommended in conjunction with a high cut boot that gives ankle support.

### Hand Protection

Consult the Material Safety Data Sheet for recommended protection when handling hazardous materials.

Hands often need to be protected from heat/cold, abrasion, chemicals and electrical shocks. PPE is available for each of these hazards, including:

- finger guards
- thimbles
- hand pads
- mitts
- gloves.

If gloves or other devices are necessary, they should fit properly and do the job required. Note, in some instances, that gloves or other forms of hand protection are not recommended particularly around moving machinery since the glove can get caught and pull the worker into the moving parts.

### Respiratory Protection

There are two major categories of respirators. The most common type to be found in a CTS classroom is the Air Purifying Respirator (APR) that is designed to remove dust, fume and mist particles. APRs are further divided into disposable and reusable types. The second, more specialized category is the atmosphere supply respirator, which includes Self-contained Breathing Apparatus (SCBA) used, for example, in auto body painting.

Remember, APR is only as good as its seal and its ability to filter out the contaminates for which it was designed.

The choice of respirator depends on the type of hazard and the degree of use. For example:

- disposable fiber respirators are simple types of air purifiers that cover the nose and mouth. They can be used in conjunction with low levels of dust, mist and fumes. Once the paper fibers have become loaded the filter must be disposed of safely
- reusable half and full face respirators are usually made of rubber and protect against certain dust, mists, gases and vapours using disposable or rechargeable cartridges.

In all cases, it is important to maintain the equipment and ensure a proper seal around the face when in use.

**Attachment 6**

# Workplace Hazardous Materials Information System

The following is a brief overview of Workplace Hazardous Materials Information System (WHMIS) and how it applies to schools. It is not meant to be a comprehensive description of WHMIS. Questions pertaining to specific details regarding WHMIS should be directed to the school board's occupational Health and Safety Department, or to Alberta Labour.

WHMIS is a system to ensure that workers are provided with complete and accurate information regarding hazardous products that they use, and to ensure that the information is used to provide safe working conditions. It is a Canada-wide system that regulates suppliers, employers and workers.

Suppliers must inform purchasers of the properties, hazards and procedures for safe use of the hazardous materials they are buying.

Employers and workers must become knowledgeable about this hazard information and must use the information to ensure safe use of the materials, under normal and emergency conditions.

## Why WHMIS?

WHMIS is intended to solve several problems that currently exist at some work sites, including schools. These problems include:

- unlabelled or inadequately labelled substances
- inadequate information on hazards and precautions relating to hazardous materials
- lack of awareness by employers and workers about the materials they use
- improper use of hazardous materials.

These problems are resulting in an unacceptable incidence of injuries, illnesses, and allergies resulting from exposure to hazardous substances, and the associated loss of work time, money and quality of life.

## Legal Status of WHMIS

WHMIS is a federal law supplemented by provincial laws. Therefore, the requirements of WHMIS **must** be followed.

School administrators and teachers, as well as other paid workers in the school, are "designated occupations" under the legislation. Therefore, literally all workers in the school are responsible for WHMIS requirements in their work. Although "student" is not a designated occupation in legislation, it is important that students become knowledgeable and follow WHMIS provisions.

## Elements of WHMIS

WHMIS is composed of three key elements:

- Labels
- Material Safety Data Sheet (MSDS)
- Worker Education.

### Labels

There are two different types of WHMIS labels that can be attached to a controlled product: the Supplier Label and the Workplace Label.

The Supplier Label contains information regarding the product's name, health risks, safe handling procedures, first-aid measures and the manufacturer or supplier identity. The Supplier Label also must display the applicable WHMIS symbols and must make reference to the product's Material Safety Data Sheet. All original containers of controlled products from manufacturers or suppliers must have this information.

### Consumer Products

Many of the products used in a school are "Consumer Products" and are partially exempt from WHMIS requirements. As a result, these products do not require Workplace Labels provided their original labels are legible, and they are stored and used in their original containers. However, once they have been decanted or their original labels have been replaced with workplace labels, they become WHMIS-controlled and must meet all labelling and Material Safety Data Sheet requirements.

### Material Safety Data Sheets

A Material Safety Data Sheet (MSDS) for each controlled product that is used or available for use must be readily accessible at the work site.

The MSDS contains nine sections of important information:

- Product Identification and Use
- Hazardous Ingredients
- Physical Data
- Fire and Explosion Data
- Reactivity Data
- Toxicological Data
- Preventive Measures
- First-aid Measures
- Preparation Date.

The MSDS is NOT:

- all the information needed for safe use of a product in every situation
- a document only to be read and filed away.

A binder of MSDSs should be maintained and located in the area where the products are used. MSDSs should be reviewed before using a product or instructing anyone else in its use. An MSDS cannot be more than three years old (from indicated preparation date on MSDS). Any MSDS older than this is invalid and must be replaced as soon as possible with an updated version. Updated MSDSs are usually readily available from the supplier. A WHMIS-controlled product should not be used if there is no MSDS on-site.

**Worker Education**

The employer must ensure that each worker is provided, or has whatever amount of education and training is necessary, to ensure safe use of each controlled product under normal and emergency conditions. Thus, personnel who use or come into contact with WHMIS-controlled products and Transportation of Dangerous Goods must be identified and their training needs determined (see Attachment 7). Initial and regular refresher training must be provided. The training given should also be regularly evaluated for relevance and effectiveness.

**Attachment 7**

## Transportation of Dangerous Goods

"Dangerous goods" are defined here as potentially hazardous materials that are explosive, flammable, poisonous, infectious, radioactive or corrosive. The *Transportation of Dangerous Goods (TDG) Act* exists to protect people, the environment, or property when these goods are being transported by road, rail, sea or air. TDG applies to transport only. It does not apply within the workplace—only WHMIS does. Shippers, carriers and receivers are all responsible for ensuring that shipments of dangerous goods comply with federal and provincial regulations as well as municipal bylaws.

### TDG Regulations

The *Transportation of Dangerous Goods Act and Regulations* were enacted to promote public safety when dangerous goods are handled, offered for transport, or transported in Canada. The regulations prescribe safety standards and requirements, and provide a mechanism for communicating the relative degree and nature of the hazard.

### Legal Status of TDG

The transport of dangerous goods by road is regulated under provincial regulations, which parallel the *Federal Transportation of Dangerous Goods Act.* Compliance is ensured in Alberta by Alberta Transportation and Utilities. Inspectors may issue tickets on the road, for infractions. Typically, most infractions relate to deficiencies in training, shipping documentation or labelling.

### Who Is Involved?

All persons who handle, transport or offer for transport dangerous goods must meet the TDG Regulation requirements. The dangerous goods most likely to be transported by school system vehicles and personnel include chemical materials for instructional purposes, cleaners and other janitorial products, solvents and petroleum products, paints, and assorted chemical wastes. As a result, within a school, the following personnel should be knowledgeable regarding TDG Regulations:

- school administrators
- teachers responsible for technical areas
- lab technicians
- facility operators.

TDG Regulations are composed of three keys elements:

- training
- shipping documents
- labelling.

### Training

No person can handle, offer for transport, or transport dangerous goods unless that person is properly trained or under the direct supervision of a properly trained person. A person cannot direct another person unless they also have received appropriate training. The school board must ensure that training has been received by all personnel who handle, offer for transport, or transport dangerous goods and must see that Certificates of Training (valid for three years) have been issued and are still valid. This applies to the generators of dangerous goods, schools, and carriers of dangerous goods, school board shipping department.

**Shipping Documents**

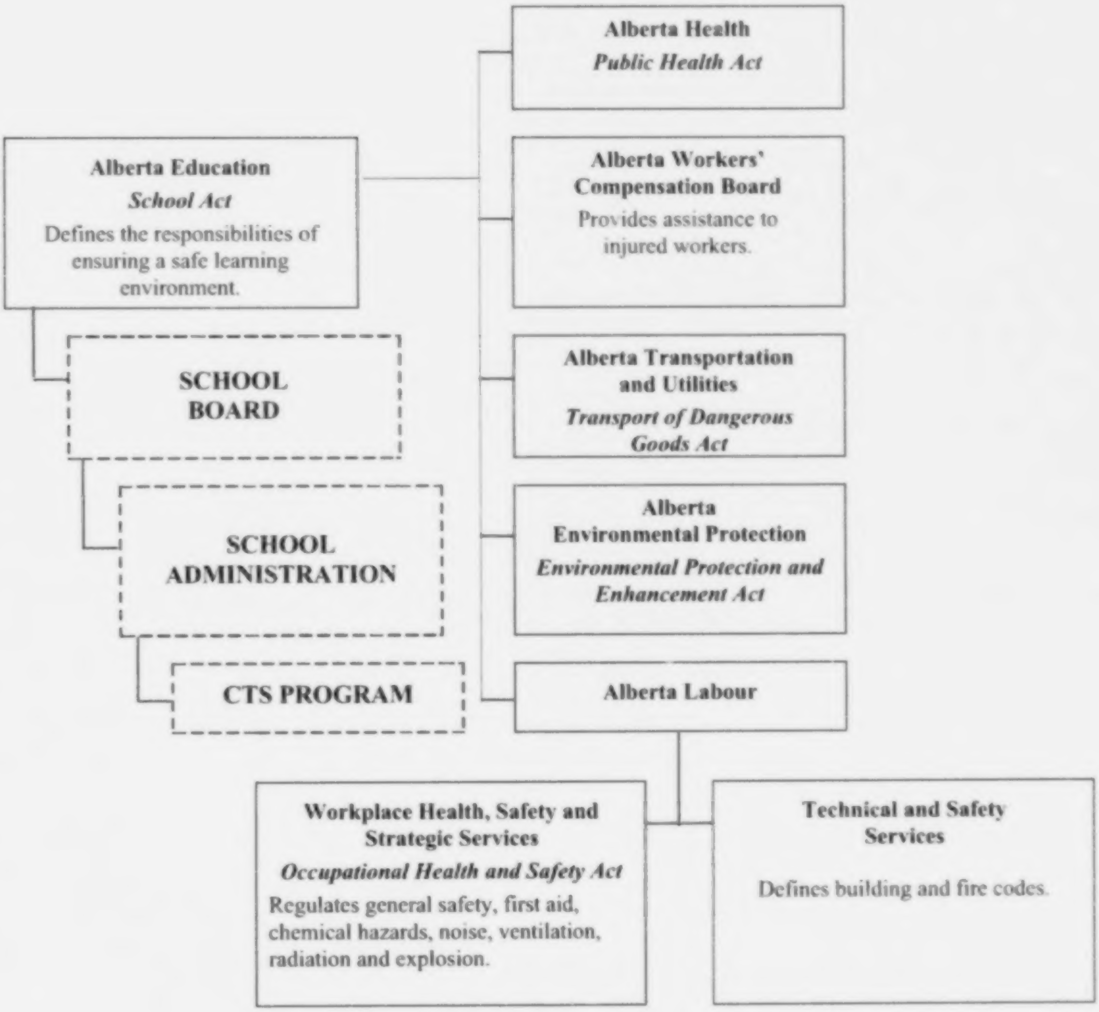
All shipments of dangerous goods must be accompanied by a shipping document containing information identifying the goods, shipper, carrier and receiver as well as quantities, safe handling and emergency procedures. The shipper, carrier and receiver must retain a copy of the dangerous goods shipping document and any additionally pertinent documents, following delivery of the consignment. *These documents must be made available to a government inspector within 15 days of a written request and must be retained for two years by all three parties.*

**Labels**

Placards on transporting vehicles are not needed for most materials carried in the school system because of the small quantities involved. There are, however, some exceptions. Boxes containing separate classes of dangerous goods must be labelled with the primary classification, orientation sticker if liquid, and any other pertinent safe handling information. Individual containers of dangerous goods, if shipped separately, must have a TDG label attached indicating proper shipping name, PIN number, primary and secondary classifications, an orientation sticker if liquid and any other pertinent handling information.

Attachment 8

## Overview of Legislation and Key Players Related to Health and Safety in CTS Program


Alberta Health
Public Health Act
Alberta Education
School Act
Defines the responsibilities of ensuring a safe learning environment.
Alberta Workers' Compensation Board
Provides assistance to injured workers.
SCHOOL BOARD
Alberta Transportation and Utilities
Transport of Dangerous Goods Act
SCHOOL ADMINISTRATION
Alberta Environmental Protection
Environmental Protection and Enhancement Act
CTS PROGRAM
Alberta Labour
Workplace Health, Safety and Strategic Services
Occupational Health and Safety Act
Regulates general safety, first aid, chemical hazards, noise, ventilation, radiation and explosion.
Technical and Safety Services
Defines building and fire codes.

Attachment 9

## Due Diligence in the CTS Classroom: Provision of a Safe Work Environment

### A. Physical Environment

- Maintain a clean and orderly work environment.
- Ensure that all tools, machines, safety, and other equipment, are maintained, safe and in good working condition.
- Be able to use competently and safely all tools, machines, safety and other equipment.
- Know what safety devices are necessary, and be familiar with and able to use all safety devices for your tools, machines and equipment.
- Know the locations of and be able to use fire extinguishers.
- Be sure that fire extinguishers are maintained.
- Ensure proper storage of all materials and supplies.
- Be able to operate the electrical safety control system in the teaching environment.
- Check that lighting, heating/cooling, plumbing and ventilation are functioning and adequate. Report inadequacies to your administrator.

### B. Program

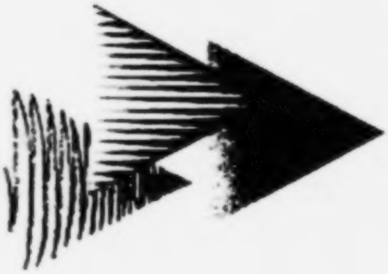
- Provide an exemplary model of how to operate safely in the work environment.
- Provide a safety training program for your students with respect to all tools, machines, safety and other equipment, that contains the following elements:
  - demonstration and explanation
  - guidance and observation until competence is achieved
  - inform the student when competence is achieved
  - formal recognition of competence
  - ongoing monitoring of performance.
- Ensure that all students know and can perform the emergency procedures established as part of the safety program.
- Ensure that students report all accidents/incidents/near-misses.
- Ensure that all students use appropriate safety gear when necessary.
- Maintain a high level of order and discipline.
- Do not accept any unsafe behaviour. Remove any student who is acting in an unsafe manner, and ensure that he or she can operate safely before re-admittance.
- Ensure that all students handle all materials and supplies in a safe manner.
- Ensure that students are dressed safely.
- Continually monitor the student's learning environment.

### C. Emergency Response Skills

- Know the school's emergency response plan.
- Know your role in the school emergency response plan.
- Become an emergency response team member.
- Respond appropriately to emergencies.
- Be able to use first-aid kit equipment.
- Become first-aid certified—*Emergency Level/CPR*.

## D. Accident/Incident Investigation Skills

- Know the accident/incident reporting procedure.
- Know what accidents/incidents are to be reported.
- Be able to prepare full and accurate reports.
- Know to whom reports must be given.
- Treat near-miss information appropriately.
- Use accident/incident/near-miss information in the continual upgrading and provision of a safer work environment.



# CAREER & TECHNOLOGY STUDIES

## Manual for Administrators, Counsellors and Teachers

Appendix 4:

# Strategies for Instruction in CTS

June 1998

*The information provided in this appendix can be used to provide a basis for further collaboration and discussion at the local level in planning effective instruction in CTS.*

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## PURPOSE

This appendix provides a range of instructional strategies teachers may wish to consider as they plan delivery of CTS courses. Teachers may use this information to:

- plan for experiential and active learning while assuming roles of facilitator and coach in the learning process
- identify opportunities for making connections in learning
  - among the 22 CTS strands
  - with other areas of the curriculum
- facilitate individual and group enterprise through teamwork and cooperative learning
- manage program delivery and student placement in special circumstances where:
  - CTS courses and Integrated Occupational Program (IOP) courses are delivered concurrently
  - students wish to make transitions from IOP courses into CTS courses.

## LEARN BY DOING/ACTIVE LEARNING

Active learning occurs when students learn by doing and reflect on the processes used. Active learning requires that students are not just passive recipients of information, but develop ability to apply what they are learning.

Refer to Chart 3: Positive Classroom Climate Checklist.

CTS places an emphasis on learning by doing. Essentially, the teacher's role in this process is that of facilitator, guide and coach. It takes time to develop a learning atmosphere conducive to active learning. The classroom climate should be friendly and nonthreatening, with appropriate levels of trust, flexibility and mutual respect. The following strategies may be effective in facilitating an active learning approach in CTS.

**Agendas**

Encourage students to prepare an agenda of tasks to be completed. Ideally, the agenda is cooperatively developed and forms a meaningful basis for subsequent activity.

**Action Planning**

As more effective results are generally achieved through purposeful pursuit than by chance, students benefit by developing a plan of individual steps that need to be taken to accomplish each task. Action plans can be developed through small group planning sessions, and can be guided through appropriate questioning:

- What do we wish to accomplish?
- How will we achieve results?
- When will the task be completed?
- What resources do we need?

**Motivating**

Active learning relies on students wanting to become involved. Students may choose to participate because of idea ownership, opportunities for choice, team spirit, group loyalty and interest. Motivation involves developing interests, facilitating involvement, and encouraging individual ownership and responsibility for learning.

**Active Listening**

Teachers and students are encouraged to engage in active listening. It demands high levels of concentration, devoting attention to the speaker, avoiding interrupting, being receptive, listening rather than just hearing, asking for clarification, elaboration and specific examples, and reserving judgement.

**Discussing**

Opportunity for discussion is an important part of active learning. It can be spontaneous and associated with the task, or more structured in becoming the task in itself. Ideally, discussion should involve everyone, with no one person being allowed to dominate the exchange of ideas.

An effective facilitator may use "icebreaker" activities to help members of a new group get to know each other, and encourage participants to stay on task.

The facilitator should be alert to the needs of the group and respond as appropriate without being dominant or dictatorial. By asking questions, such as "What if you tried ...?", teachers can help students understand the essence of a problem and encourage promising ideas.

**Negotiating**

Negotiation involves reaching mutually acceptable agreements on what to do next, how to do it, how much time to take and what constitutes a successful outcome. Negotiation occurs between teachers and students and among the students themselves. Skills in negotiation improve with practice.

**Networking**

Networking involves the clustering of individuals who share a common interest or need. Networking can support learning, with members communicating openly and freely to share knowledge and expertise. Teachers are encouraged to establish support networks to help meet the needs of students. These may include:

- in-school support networks among school administrators, counsellors, teacher–librarians, other teachers, office managers
- community-based support networks among parents, local business and industry, community representatives.

**Reflecting**

Reflection involves looking back over a recently completed activity to summarize, reinforce and assess learning that has occurred. Reflection can occur on an independent or group basis, and be structured or unstructured. The following phrases may be used to initiate reflection on tasks completed.

- Before I began this course …
- Some discoveries that I made were …
- My work in this course was made easier because …
- In this course I had difficulty with … because …
- One thing I would do differently next time is …
- The part of this course that was most worthwhile was …
- I would like to learn more about …
- Now that I can … I will be able to

## APPLIED LEARNING/MAKING CONNECTIONS

CTS courses provide career-specific contexts through which students can reinforce, extend and apply learning from other core and optional programs. As students recognize the relevance of prior learning to their future lives, they are motivated to develop higher levels of competency.

Course planning should focus attention on ways to help students make connections between abstract concepts developed in other curriculum areas and their application in practical settings. Teachers can enhance students' ability to make connections across the curriculum by:

- increasing their sensitivity to the content of other subject areas—and working with other teachers to design courses, lessons and activities that strengthen linkages
- identifying prior learnings in other subject areas that apply in practical CTS contexts—and being prepared to review and/or teach particular core concepts/skills prior to their use in a particular CTS course
- designing projects and assignments that purposely link learnings from one discipline/subject to another—and collaborating with other teachers in their delivery to help students integrate learning across several CTS strands and/or other disciplines
- becoming familiar with the processes used for inquiry, research, reporting and decision making in other disciplines—and providing opportunities for students to use similar processes and vocabulary in CTS settings.

## MAKING CONNECTIONS WITHIN CTS

Refer to Attachment 1: Opportunities for Making Connections within CTS.

Each CTS strand provides opportunities for students to develop competencies that link with, or enhance what they learn in other strands. The following strategies are suggested for enhancing connections among the 22 CTS strands.

### Strand Clusters

Refer to the *CTS Guide to Standards and Implementation*, Section H: Linkages/Transitions.

Teachers may wish to develop familiarity with courses across various strand "clusters" in CTS; e.g., business education, home economics, industrial education, natural resources. Subsequent course delivery may involve combining courses from two or more strands and/or working with other teachers to share the delivery of the courses.

### Process Strands

Familiarity with the scope and intent of the process strands (e.g., Enterprise and Innovation, Design Studies, Information Processing, Management and Marketing) can also enhance connections. Learning in these strands can be effectively contextualized when relevant courses are combined with other strands that are more specialized in context.

### Assessment Practices

Refer to the *CTS Guide to Standards and Implementation*, Section G: Assessment Tools.

A number of generic and strand-specific assessment tools have been developed to help teachers assess learning outcomes within each CTS strand. Assessment tools establish benchmarks for student performance, and help assess student achievement fairly and equitably. As students become familiar with the criteria for assessment as defined through each tool, they begin to understand how the skills they develop in one course transfer to other areas of learning.

### Integrating Concepts

Refer to Attachment 2: Integrating Concepts in CTS.

A number of integrating concepts are developed in and reinforced across the CTS strands. These concepts include:

- career
- technology
- design
- enterprise
- environment
- family
- legislation
- safety
- service.

Focusing attention on these concepts as appropriate in course delivery heightens awareness of their significance in a variety of personal and work-related situations.

## MAKING CONNECTIONS ACROSS THE CURRICULUM

Refer to Attachment 3: Opportunities for Making Connections Across the Curriculum.

CTS courses provide career-specific contexts through which students can reinforce, extend and apply knowledge and skills developed in other core and optional programs. Course planning may well involve helping students to make connections between abstract concepts developed in other disciplines and their application in practical settings. The following strategies are suggested for enhancing connections in learning across the curriculum.

### Concept Mapping

Refer to the *CTS Guide to Standards and Implementation*, Section H: Linkages/Transitions.

Science and mathematics are two core program areas where an understanding of core concepts and skills are often required prior to their application in practical CTS contexts. Teachers are encouraged to become familiar with the content and processes developed in other core and optional program areas so as to:

- maintain consistency in expectations and demands placed on students
- identify prior learnings, prerequisites and corequisites necessary for success in CTS courses
- avoid instances of overlap or repetition between CTS and other core/optional courses.

### Application of Process

Refer to the *CTS Guide to Standards and Implementation*, Section G: Assessment Tools.

CTS students are also required to use many of the process skills developed in core courses. To support the application of process in CTS, developmental frameworks are provided for laboratory investigation, research, reports/presentations, issue analysis, and negotiation/debate. Each framework is consistent with the use of related processes in other disciplines—science, language arts, social studies—and can be used to guide students in their application of process in career-specific settings.

### Vertical Integration

Vertical integration implies the sequencing of instruction across subject areas so that particular concepts and skills are developed prior to their application in practical CTS settings. Teachers are encouraged to use appropriate references to:

- identify relevant concepts/skills developed in core disciplines; e.g., mathematics, science, and the possible need to review these concepts/skills prior to their use in CTS courses
- identify prior learnings necessary for success in CTS courses, and the possible need to teach core concepts/skills if they are used in a CTS course prior to their development in a core discipline.

### Combining CTS and Non-CTS Courses

The 1-credit course structure of CTS allows flexibility in combining CTS courses with non-CTS core and optional courses. Such strategies are effective in helping students to make connections across the curriculum.

Refer to the *Guide to Education: ECS to Grade 12*, Program Planning.

**Combined courses must meet all requirements for course delivery, and ensure that:**

- **a written description of the combined course is provided for students/parents, and students are given the option to take the non-CTS course with or without the combined CTS course**

- **appropriate learning environments (including facilities and equipment), learning resources and instructional expertise are available to support the delivery of the combined course**
- **students are provided access to a minimum of 25 hours of instruction per credit at the high school level, with exceptions as noted in the *Guide to Education: ECS to Grade 12***
- **students know precisely when and where they can regularly access the instruction they need**
- **the integrity and intent of curriculum and assessment standards as defined for each CTS course are maintained**
- **instruction addresses the evaluation criteria established for both the CTS course(s) and non-CTS course, and that each is graded and reported separately.**

## TEAMWORK/COOPERATIVE LEARNING

The ability to work as part of a team is essential in the workplace. The transition to a technology- and information-based society requires today's workers to pool their expertise. This trend can be expected to become even more pronounced in the future.

Refer to Attachment 4: Characteristics of Effective Group Members.

Cooperative learning also promotes active learning and encourages individual and group enterprise. Group learning can help students to develop increasingly independent and responsible learning habits and to become self-disciplined.

CTS offers many opportunities for students to work in team settings, formally and informally. The teacher's role in cooperative learning involves:

Refer to Form 3: Group Member Effectiveness.

- communicating objectives, assignments and tasks
- determining the size and composition of groups
- arranging for appropriate facilities, equipment and materials
- informing the group of behavioural expectations
- informing both team leaders and members of their roles, and clarifying learning tasks with all
- acting as a resource person, coach and monitor
- evaluating the product of the group and performance of each group member.

## ESTABLISHING LEARNING TEAMS

Students are often motivated through their involvement with other members of a team, and may develop a greater commitment to learning. Effective teamwork requires the establishment of learning groups whose size and nature are appropriate to the nature of the learning task.

- Discussion groups encourage students to become involved with their peers, and provide opportunities for students to explore classroom, community or national issues when given background information and an understanding of objectives.
- Brainstorming groups encourage creative thinking and problem solving, and require students to identify as many ideas or suggestions as possible within a given time frame. A quantity of ideas is desired, "hitchhiking" on the ideas of others is permitted, judgement is deferred until the end of the activity, and criticism is not allowed.
- Buzz groups involve small clusters of students who, for a short period of time, seek the solution to an issue or problem. A variety of solutions to the issue are sought, the pros and cons of each proposal considered, consensus developed and an appropriate alternative selected.
- Laboratory groups can be established to complete a project, conduct an investigation, or practice a skill demonstrated by the teacher. Assigned questions or research can become a part of the group activities.
- Tutorial groups can be established to assist students who need extra help or additional practice, or for students who would benefit from enrichment. Tutorial groups are led by a teacher or student, and focus on meeting individual needs.
- Role-playing groups help students understand the perspectives and feelings of others regarding a controversial topic. Each group member is given a role to assume and defend, regardless of their actual beliefs.

## FACILITATING COOPERATIVE LEARNING

The following guidelines may be effective in facilitating teamwork and cooperative learning in CTS.

### Establish Ground Rules

Ground rules represent an explicit, negotiated and accepted code of expectations. Ideally, they are enforced through peer group pressure. Specific ground rules can be negotiated, but also include some givens—safety, attendance, respect for others.

**Observe Team Process**

Team activities are accomplished through interaction between individuals. This interaction should be observed by the teacher, who focuses on the nature of the interaction and its consequences. Observation of team process permits the identification of methods by which the team achieves its goals. Feedback on process allows the team to examine the way it works and explore ways of improving its effectiveness. The following questions suggest a possible approach to observing team process:

- How did the group begin the task?
- Was a leader appointed? If so, by whom?
- What method of appointment was used? Did a leader naturally emerge?
- How were decisions reached? If no decisions were reached, why not?
- Was there negotiation, confrontation, and/or cooperation?
- How was consensus established? Did the majority rule?
- Who spoke the most? The least?
- Were any members ignored? If so, why?

**Manage Group Dynamics**

Interaction between team members can often be anticipated and directed. Management of group dynamics involves adjusting the number and composition of work groups in effective ways.

**Resolve Conflict**

Conflict may arise among team members during an activity. Resolution of the conflict should, when possible, be a responsibility of team members. Conflict provides opportunities for students to develop critical skills in negotiation and mediation.

Students and teacher can expect to compromise, not only through negotiation and mediation, but also because of organizational constraints. For certain principles, however, there can be no compromise (see "Establish Ground Rules").

**Plan for Debriefing**

Effective debriefing summarizes, reinforces and assesses learning. The process should allow sufficient time to reflect on what has happened and what students have learned. Debriefing can occur within learning teams, and be prompted with key questions. Teachers can facilitate debriefing by:

- including time for debriefing in their long-range plans
- organizing students into smaller groups to give everyone an opportunity to share their feelings
- asking open-ended questions
- summarizing team accomplishments, the knowledge/skills developed, and team processes observed.

## IOP–CTS TRANSITIONS

Refer to Attachment 5: Comparing the IOP and CTS Programs.

The Integrated Occupational Program (IOP) is designed for selected students who need special learning support systems, including hands-on learning and remediation in mathematics, science, social studies and language arts. In general, IOP courses and learning environments are characterized by:

- more hands-on learning with minimal reference to occupation-related theory
- greater emphasis on generic self-management skills than on career-specific competencies
- smaller class sizes, thus providing for more individual assistance in developing course-specific competencies.

Although many of the CTS strands/courses may extend competencies that IOP students have initially developed in 16–26–36 occupational courses, these connections do not represent course equivalencies. Curriculum and assessment standards defined for CTS courses are different from those defined for IOP occupational courses.

### MANAGING CONCURRENT PROGRAM DELIVERY

Refer to Attachment 6: Connections Between IOP and CTS.

Some schools may schedule IOP students and CTS students in the same time block/facility. Teachers may choose to manage the concurrent delivery of CTS and IOP courses by:

- using connections between courses in CTS and the content of IOP occupational courses and student workbooks
- clarifying performance expectations for CTS and IOP students
- using a combination of IOP and CTS instructional materials to deliver the required IOP generic learnings
- providing support for IOP students to develop and apply academic competencies; e.g., mathematics, language arts
- developing a "buddy system" among IOP and CTS students
- providing IOP students with as much practice time as possible.

**IOP students who wish to receive credit in CTS courses must meet all of the learner outcomes (learner expectations in 1997 document) to the standard established for each CTS course.**

## PLANNING SUCCESSFUL TRANSITIONS

After completing Grade 11 or Grade 12 IOP programs, some students may be able to successfully transfer from IOP occupational courses into related CTS strands/courses. Students who demonstrate high levels of success in the IOP mathematics, science, language arts and social studies curriculum—16–26–36 courses—are more likely to be able to:

- handle the increased requirements to read, write, make calculations and take measurements in the CTS program
- understand and apply theory that is fundamental to technical processes.

Refer to Attachment 6: Connections Between IOP and CTS.

Assessment of prior learning assists in identifying previously developed IOP competencies and their relationships to the learner outcomes of particular CTS courses. When choosing appropriate CTS strands/courses for IOP students, care should be taken to select from those that:

- link with and extend concepts/skills already introduced in related IOP occupational courses and student workbooks
- involve considerable hands-on learning with limited emphasis on theory
- support workplace entry.

A list of courses that may be suitable for IOP students transferring into CTS courses is provided in Attachment 6: Connections Between IOP and CTS.

Attachment 1

## Opportunities for Making Connections within CTS

| CTS Strands | Agriculture | Career Transitions | Communication Technology | Community Health | Construction Technologies | Cosmetology Studies | Design Studies | Electro-Technologies | Energy and Mines | Enterprise and Innovation | Fabrication Studies | Fashion Studies | Financial Management | Foods | Forestry | Information Processing | Legal Studies | Logistics | Management and Marketing | Mechanics | Tourism Studies | Wildlife |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Agriculture | ■ | ■ | ▨ | ▨ | ■ |  | ■ | ▨ | ▨ | ▨ | ■ |  | ▨ | ▨ | ▨ | ▨ | ▨ |  | ■ | ■ |  | ▨ |
| Career Transitions | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Communication Technology | ▨ | ■ | ■ |  |  |  |  | ▨ |  | ▨ |  | ▨ |  |  |  | ▨ | ▨ |  | ▨ |  |  | ▨ |
| Community Health | ▨ | ■ |  | ■ |  |  |  | ▨ | ▨ | ▨ |  |  |  | ▨ | ■ | ▨ | ▨ |  | ▨ | ▨ |  | ■ |
| Construction Technologies | ■ | ■ |  |  | ■ |  |  | ▨ |  | ▨ |  |  | ▨ |  | ▨ | ▨ | ▨ |  | ▨ |  |  |  |
| Cosmetology Studies |  | ■ |  |  |  | ■ |  |  |  | ▨ |  | ▨ | ▨ |  |  | ▨ | ▨ |  | ▨ |  |  |  |
| Design Studies | ■ | ■ |  |  |  |  | ■ | ▨ |  | ▨ |  | ■ |  | ▨ |  | ▨ |  |  | ▨ | ▨ |  |  |
| Electro-Technologies | ▨ | ■ | ▨ | ▨ | ▨ |  | ▨ | ■ | ▨ | ▨ | ▨ |  |  |  | ▨ | ▨ |  |  | ▨ | ■ |  | ▨ |
| Energy and Mines | ▨ | ■ |  | ▨ |  |  |  | ▨ | ■ | ▨ | ■ |  |  |  | ▨ | ▨ | ▨ |  | ▨ | ■ |  | ▨ |
| Enterprise and Innovation | ▨ | ■ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ■ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ |  | ■ | ▨ | ▨ | ▨ |
| Fabrication Studies | ■ | ■ |  |  |  |  |  | ▨ | ■ | ▨ | ■ |  | ▨ |  | ▨ | ▨ | ▨ |  | ▨ |  |  |  |
| Fashion Studies |  | ■ | ▨ |  |  | ▨ | ■ |  |  | ▨ |  | ■ |  |  |  | ▨ |  |  | ▨ |  |  |  |
| Financial Management | ▨ | ■ |  |  | ▨ | ▨ |  |  |  | ▨ | ▨ |  | ■ | ▨ |  | ▨ | ▨ |  | ▨ | ▨ |  | ▨ |
| Foods | ▨ | ■ |  | ▨ |  |  | ▨ |  |  | ▨ |  |  | ▨ | ■ |  | ▨ |  |  | ▨ |  | ▨ | ▨ |
| Forestry | ▨ | ■ |  | ■ | ▨ |  |  | ▨ | ▨ | ▨ | ▨ |  |  |  | ■ | ▨ | ▨ |  | ▨ | ▨ | ▨ | ■ |
| Information Processing | ▨ | ■ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ■ | ▨ |  | ■ | ▨ | ▨ | ▨ |
| Legal Studies | ▨ | ■ | ▨ | ▨ | ▨ | ▨ |  |  | ▨ | ▨ | ▨ |  | ▨ |  | ▨ | ▨ | ■ |  | ▨ |  | ▨ | ▨ |
| Logistics | ▨ | ■ |  |  |  |  |  |  | ▨ | ▨ |  |  |  |  | ▨ | ▨ |  |  | ▨ |  |  |  |
| Management and Marketing | ■ | ■ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ■ | ▨ | ▨ | ▨ | ▨ | ▨ | ■ | ▨ |  | ■ | ▨ | ▨ | ▨ |
| Mechanics | ■ | ■ |  | ▨ |  |  | ▨ | ■ | ■ | ▨ |  |  | ▨ |  | ▨ | ▨ |  |  | ▨ | ■ |  |  |
| Tourism Studies |  | ■ |  |  |  |  |  |  |  | ▨ |  |  |  | ▨ | ▨ | ▨ | ▨ |  | ▨ |  | ■ | ■ |
| Wildlife | ▨ | ■ | ▨ | ■ |  |  |  | ▨ | ▨ | ▨ |  |  | ▨ | ▨ | ■ | ▨ | ▨ |  | ▨ |  | ■ | ■ |

■ Provides many direct links with competencies in this strand. Students reinforce, extend and apply a substantial number of knowledge and/or skill components in practical contexts.

▨ Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes.

Attachment 2

## Integrating Concepts in CTS

| Integrating Concept | Agriculture | Career Transitions | Communication Technology | Community Health | Construction Technologies | Cosmetology Studies | Design Studies | Electro-Technologies | Energy and Mines | Enterprise and Innovation | Fabrication Studies | Fashion Studies | Financial Management | Foods | Forestry | Information Processing | Legal Studies | Logistics | Management and Marketing | Mechanics | Tourism Studies | Wildlife |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Career | X | ■ | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Technology | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |  |
| Design | X |  | X |  | X | X | ■ | X |  | X | X | X |  | X |  | X |  |  | X | X |  |  |
| Enterprise | X |  |  | X |  | X |  |  |  | ■ |  | X | X | X |  |  | X |  | X |  | X |  |
| Environment | ■ |  |  | X |  |  | X | X | ■ | X |  |  | X |  | ■ |  | X |  |  | X | X | ■ |
| Family |  |  |  | ■ |  | X |  |  |  |  |  | X | X | X |  |  | X |  |  |  |  |  |
| Legislation | X |  |  | X |  |  |  | X | X |  |  |  | X |  | X |  | X | X | X | X |  | X |
| Safety | ■ | ■ | ■ | ■ | ■ | ■ | X | ■ | ■ | X | ■ | X |  | ■ | ■ | X | X | X | X | ■ | X | X |
| Service | X |  |  |  |  | X |  | X |  |  |  |  |  | X |  |  | X |  | X | X | X |  |

■—primary development X—application and reinforcement

**Career:** provides opportunities for students to identify and assess a wide range of career options, in their personal life and work life; students learn about career and occupational expectations and opportunities.

**Technology:** focuses on the use of all levels of technology, from simple hand tools to sophisticated computer and telecommunications technologies; students learn to select and manage available technology to respond to challenges.

**Design:** presents the concept of design as a generic strategy that can be used across the CTS strands for resolving problems; resolution may be in two- or three-dimensions and involve plans, systems, materials, etc.

**Enterprise:** develops students' ability to identify and respond to challenges and opportunities in creative ways, and to respond to change efficiently and effectively.

**Environment:** addresses a variety of relevant environmental issues; focuses attention on citizen/worker empowerment; develops strategies for problem solving through goal setting, planning, negotiation and consensus building.

**Family:** applies related concepts in contexts related to the individual's role in the family and the changing nature of the family as a support system and economic unit.

**Legislation:** develops understanding of the processes used in establishing and changing laws; makes specific reference to laws and/or statutes and general reference to regulations, policies and standards that imply legislation.

**Safety:** establishes expectations regarding safe and responsible behaviour in situations that involve the use of tools, equipment, materials and facilities.

**Service:** focuses attention on strategies for identifying and responding to client/customer needs in a proactive manner; addresses career options within the service sector.

Attachment 3

## Opportunities for Making Connections Across the Curriculum

| CTS Strands | Junior High | | | | | | | Senior High | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Language Arts | Social Studies | Mathematics | Science | Health & PLS | Physical Education | Fine Arts | English | Social Studies | Mathematics | Science (General) | Biology | Chemistry | Physics | CALM | Physical Education | Fine Arts | Social Sciences | Second Languages |
| Agriculture | ▨ | ▨ | ■ | ■ | | | | ▨ | ▨ | ■ | ■ | ■ | ■ | | ▨ | | ▨ | | |
| Career Transitions | | | | | | | | | | | | | | | | | | | |
| Communication Technology | ▨ | ▨ | ▨ | | | | ▨ | ▨ | ▨ | ▨ | ▨ | | | | | | ▨ | | |
| Community Health | ▨ | ▨ | | ▨ | ■ | ▨ | | ▨ | ▨ | | ▨ | ■ | ▨ | | ■ | ▨ | | | |
| Construction Technologies | ▨ | ▨ | ■ | ■ | ▨ | | | ▨ | ▨ | ■ | ■ | ▨ | ▨ | ▨ | ▨ | | | | |
| Cosmetology Studies | | | | | | | | | | | | | | | | | | | |
| Design Studies | | | ▨ | ▨ | | | ■ | | | | ▨ | | | ▨ | | | ■ | | |
| Electro-Technologies | ▨ | | ■ | ■ | | | ▨ | ▨ | | ■ | ■ | | | ■ | ▨ | | | | |
| Energy and Mines | ▨ | ▨ | ▨ | ■ | | | | ▨ | ▨ | | ■ | | ■ | ■ | ▨ | | | | |
| Enterprise and Innovation | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ |
| Fabrication Studies | ▨ | ▨ | ■ | ■ | ▨ | | | ▨ | ▨ | ■ | ■ | | ▨ | ▨ | ▨ | | | | |
| Fashion Studies | | | ▨ | ▨ | | | ▨ | | ▨ | ▨ | | | | | | | ■ | ▨ | |
| Financial Management | ▨ | ▨ | ▨ | | | | | ▨ | | ▨ | | | | | ▨ | | | | |
| Foods | | ▨ | ▨ | ▨ | ■ | | | | ▨ | ▨ | ▨ | ▨ | ▨ | | ▨ | ▨ | | ▨ | ▨ |
| Forestry | ▨ | ▨ | ▨ | ■ | | ▨ | | ▨ | ▨ | ■ | ■ | ■ | | | ▨ | ▨ | | | |
| Information Processing | ■ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ■ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ |
| Legal Studies | ▨ | ▨ | | ▨ | | | | ▨ | ▨ | | ▨ | | | ▨ | ▨ | | | | |
| Logistics | | ▨ | | | | | | | | | | | | | ▨ | | | ▨ | ▨ |
| Management and Marketing | ■ | ▨ | ▨ | ▨ | ▨ | | | ■ | ▨ | ▨ | ▨ | | | | ▨ | | ▨ | | |
| Mechanics | ▨ | | ■ | ▨ | | | | ▨ | | ▨ | ▨ | | | ▨ | | | | | |
| Tourism Studies | ▨ | ▨ | | | | | | ▨ | ▨ | | | | | | | | | | ▨ |
| Wildlife | ▨ | ▨ | ▨ | ■ | | ■ | | ▨ | ▨ | | ■ | ■ | | | ▨ | ▨ | ▨ | ▨ | |

■ Provides many direct links with course content; students reinforce, extend and apply a substantial number of knowledge/skill components in practical contexts.

▨ Provides some links with course content, usually through the application of related technologies and/or processes.

Attachment 4

## Characteristics of Effective Group Members

**Team members should:**

- ☐ be on time and attend all group sessions
- ☐ take an active part, and contribute information, ideas and experience
- ☐ display a positive, rather than negative or critical approach
- ☐ show respect for the ideas and opinions of others
- ☐ listen when others speak, be empathetic and hear others out
- ☐ respect and interact with other members
- ☐ respect individual differences
- ☐ avoid prejudice and bias
- ☐ seek, and be open to, the ideas and suggestions of others
- ☐ encourage noncontributors to take part
- ☐ accept responsibility for the consequences of their own behaviour
- ☐ be sensitive to the feelings and concerns of others
- ☐ avoid self-serving, judgemental, blaming, grandstanding or storytelling behaviour
- ☐ stay on topic
- ☐ be genuine and open
- ☐ support others, and help them articulate their ideas
- ☐ help phrase ideas and statements
- ☐ help the group by clarifying, mediating, praising and encouraging
- ☐ help make summaries and reach conclusions
- ☐ avoid distracting the group
- ☐ use problem solving, decision making and conflict resolution frames of reference
- ☐ confine the argument to ideas and not engage in personal attacks
- ☐ act as group leader, recorder, discussion evaluator or group effectiveness monitor, as appropriate.

**Group leaders should:**

- ☐ clarify the problem or issue
- ☐ initiate discussion
- ☐ keep discussion moving
- ☐ see that all phases of the problem are discussed
- ☐ attempt to keep discussion on topic
- ☐ encourage the participation of all members
- ☐ be objective
- ☐ rephrase and clarify statements, or have others do this
- ☐ ensure that summaries or conclusions are made
- ☐ ensure that all members are treated with respect
- ☐ respect the confidence of the group
- ☐ summarize the thoughts of the group in an accurate manner.

## Comparing the IOP and CTS Programs

### Student Placement

| | IOP | CTS |
|---|---|---|
| **Target Group** | At-risk students (12.5 to 19 years of age). | All junior and senior high school students. |
| **Grade Levels** | Specific curriculum designed for Grades 8, 9, 10, 11, 12. | Designed around levels, not grades—introductory, intermediate, advanced (Grades 7–12). |
| **Proportion of Student Population** | IOP students represent 4–8% of the junior/senior high school population. (In 1994–95, there were approximately 5,000 students in 180 schools.) | Most junior/senior high school students receive 3 or more credits in CTS. |
| **Learning Styles** | Concrete learning experience. | Concrete to abstract. |
| **Expectations for Student Performance** | Students are expected to demonstrate generic skills within an occupational context with limited emphasis on theory. Grading merges student ability and effort. | Students must demonstrate a set of competencies to a specified standard, based on workplace and post-secondary expectations. Grading only occurs after the minimum competencies have been met. |
| **Credentialling Opportunities** | A Certificate of Achievement is awarded to students who have completed **80 credits**—a minimum of 27 credits in academic courses, 13 credits in optional courses and 40 credits in IOP occupational courses. | A High School Diploma is awarded to students who have completed **100 credits** and meet the requirements specified for the diploma.<br>External credentialling opportunities have been identified for specific CTS courses. |

### Program Delivery

| | IOP | CTS |
|---|---|---|
| **On-campus Learning Experiences** | *On-campus learning* (classroom/lab) is primarily used for core program and selected sections of occupational courses. | Most programs are delivered on-campus, depending on student interest, school facilities and instructional expertise. |
| **Off-campus Learning Experiences** | *Community partnerships* is a **required** component for delivery of occupational courses. This may include off-campus learning, job shadowing and mentoring. | *Off-campus learning* can be used to deliver competencies outlined in courses. Student achievement is reported using CTS courses assessment tools. |

**Attachment 6**

## Connections Between IOP and CTS

This chart identifies connections between CTS strands and IOP 16–26–36 occupational courses. The connections do not indicate course equivalencies. IOP students wishing to receive credit in CTS courses must meet all of the learner outcomes (learner expectations in 1997 document) to the standard set for each CTS course.

| | Jr. High Occupational Themes | | | Senior High School IOP Occupational Course Sequence | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CTS STRANDS** | Business Education | Personal and Public Service | Technical / Occupational | Agricultural Production | Agricultural Mechanics | Horticultural Services | Business Services | Office Services | Building Services | Construction Services | Crafts and Arts | Technical Arts | Natural Resource Services | Child and Health Care | Esthetology | Fashion and Fabric Services | Hair Care | Commercial Food Preparation | Food Services | Maintenance and Hospitality Services | Automotive Services | Service Station Services | Warehouse Services |
| Agriculture | | | ▨ | ▨ | | ▨ | | | | | | | | | | | | | | | | | |
| Career Transitions | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ |
| Communication Technology | | | ▨ | | | | | | | | ▨ | ▨ | | | | | | | | | | | |
| Community Health | | ▨ | | | | | | | | | | | | ▨ | | | | | | | | | |
| Construction Technologies | | | ▨ | | ▨ | | | | ▨ | ▨ | | | | | | | | | | | | | |
| Cosmetology Studies | | | | | | | | | | | | | | | ▨ | | ▨ | | | | | | |
| Design Studies | | | ▨ | | | | | | | | ▨ | ▨ | | | | | | | | | | | |
| Electro-Technologies | | | | | | | | | | | | | | | | | | | | | ▨ | ▨ | |
| Energy and Mines | | | ▨ | | | | | | | | | | ▨ | | | | | | | | | | |
| Enterprise and Innovation | | | | | | | | | | | | | | | | | | | | | | | |
| Fabrication Studies | | | ▨ | | ▨ | | | | | ▨ | | | | | | | | | | | | | |
| Fashion Studies | | | | | | | | | | | ▨ | | | | | ▨ | | | | | | | |
| Foods | | | | | | | | | | | | | | | | | | ▨ | ▨ | | | | |
| Forestry | | | ▨ | | | | | | | | | | ▨ | | | | | | | | | | |
| Information Processing | ▨ | | | | | | | ▨ | | | | | | | | | | | | | | | |
| Logistics | | | | | | | | | | | | | | | | | | | | | | | ▨ |
| Management and Marketing | ▨ | | | | | | ▨ | ▨ | | | | | | | | | | | | | | | |
| Mechanics | | | ▨ | | ▨ | | | | | | | | | | | | | | | | ▨ | ▨ | |
| Tourism Studies | | | | | | | | | | | | | | | | | | | | ▨ | | | |

▨ Connections exist between some courses in this CTS strand and content of the IOP student workbook.

The following courses may be suitable for IOP students transferring into CTS courses because they:

- link with and extend concepts/skills previously introduced in related IOP occupational courses and student workbooks
- involve considerable hands-on learning with limited emphasis on theory
- support workplace learning.

**Agriculture**
- AGR1010: Agriculture: The Big Picture
- AGR1030: Production Basics
- AGR1060: Consumer Products & Services
- AGR1070: Basic Landscape/Turf Care
- AGR1080: Basic Floral Design

**Career Transitions**
- CTR1010: Job Preparation
- CTR1210: Personal Safety (Management)

**Communication Technology**
- COM1020: Media & You
- COM1030: Photography 1
- COM1050: Printing 1

**Community Health**
- CMH1040: Caring for Children
- CMH1050: Child Development
- CMH1060: Home Care 1

**Construction Technologies**
- CON1010: Basic Tools & Materials
- CON1070: Building Construction
- CON1120: Project Management
- CON1130: Solid Stock Construction
- CON1160: Manufactured Materials

**Cosmetology Studies**
- COS1010: Personal Images
- COS1020: Hair Graphics 1
- COS1030: Hair & Scalp Care 1
- COS1040: Forming & Finishing 1
- COS1050: Permanent Waving 1 (The Physical Process)
- COS1060: Skin Care 1 (Basic Principles)
- COS1070: Manicuring 1
- COS1080: Theatrical Makeup 1 (Basic Principles)

**Design Studies**
- DES1010: Sketch, Draw & Model
- DES1020: The Design Process
- DES1030: 2-D Design Fundamentals

**Electro-Technologies**
- ELT1010: Electro-assembly 1

**Energy and Mines**
- ENM1010: Overview of Alberta Geology
- ENM1020: Nonrenewable Resources

**Fabrication Studies**
- FAB1040: Oxyacetylene Welding
- FAB1050: Basic Electric Welding
- FAB1100: Fabrication Principles

**Fashion Studies**
- FAS1050: Repair & Recycle
- FAS1070: Creative Yarns/Textiles

**Foods**
- FOD1010: Food Basics
- FOD1020: Baking Basics
- FOD1050: Fast & Convenience Foods

**Forestry**
- FOR1010: Why Forestry?
- FOR1020: Forest Regions of Canada
- FOR1050: Mapping & Aerial Photos
- FOR1060: Measuring the Forest 1

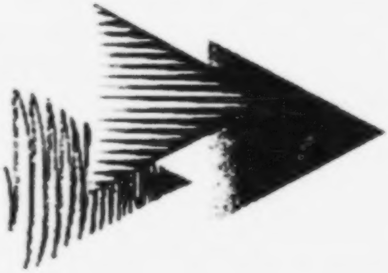
**Information Processing**
- INF1010: Computer Operations
- INF1020: Keyboarding 1
- INF1030: Word Processing 1

**Logistics**
- LOG1010: Logistics
- LOG1020: Warehouse & Distribute 1

**Management and Marketing**
- MAM1010: Management & Marketing Basics
- MAM1020: Quality Customer Service
- MAM1030: Communication Strategies 1

**Mechanics**
- MEC1010: Modes & Mechanisms
- MEC1020: Vehicle Service & Care
- MEC1040: Engine Fundamentals
- MEC1090: Electrical Fundamentals
- MEC1110: Pneumatics & Hydraulics
- MEC1150: Ride & Control Systems
- MEC1160: Structures & Materials
- MEC1170: Metal Forming & Finishing
- MEC1190: Surface Preparation 1

**Tourism Studies**
- TOU1030: Quality Guest Service
- TOU1040: The Food Sector



# CAREER & TECHNOLOGY STUDIES

**Manual for Administrators, Counsellors and Teachers**

Appendix 5:

# Planning Ahead— CTS Transitions into Post-secondary Programs and the Workplace

June 1998

*As much of the information provided in this appendix is time sensitive; teachers and counsellors are encouraged to consult with post-secondary and business partners on an ongoing basis regarding career transitions.*

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## PURPOSE

This appendix serves as a reference in planning effective transitions for CTS students into post-secondary programs and the workplace. It provides information regarding:

- career options that align with each of the 22 CTS strands
- strand-related post-secondary education and training programs offered at college, technical and university levels
- recognition of prior learning in CTS at post-secondary levels, and articulation agreements with Alberta's apprenticeship trades
- workplace credentials that can be delivered through partnerships with business, community and government organizations
- off-campus education programs that extend learning opportunities beyond the boundaries of the school.

## CAREER PLANNING AND PREPARATION

Refer to relevant career web sites, including:

- OCCINFO <www.aecd.gov.ab.ca/occinfo>
- CAREER INFORMATION HOTLINE <www.aecd.gov.ab.ca/hotline>
- HUMAN RESOURCES DEVELOPMENT CANADA <http://roe-ab.hrdc-drhc.gc.ca>.

CTS is designed to assist all students—those who plan to attend university, college or technical school, as well as those who move from high school directly into the work force—to experience smooth career transitions. As students progress from introductory- to advanced-level courses, they should develop skills in career planning, explore numerous strand-related career options, and begin to prepare for present and future career options.

Junior and senior high schools are encouraged to use current labour market information in developing career awareness within the context of specific strands and courses. Competencies relevant to career planning and awareness are defined within each CTS strand through learner outcomes (learner expectations in 1997 documents).

Assessment standards and tools provide further benchmarks for establishing appropriate levels of career awareness within specific CTS courses.

## NATIONAL OCCUPATIONAL CLASSIFICATION

Refer to Attachment 1: Overview of the National Occupational Classification.

Each CTS strand is supported with a comprehensive list of related occupations and career options that align with National Occupational Classification (NOC) descriptions. Approximately 800 linkages to the labour market are identified across the 22 CTS strands, each further described by educational and training requirements.

## CAREER TRANSITIONS

Refer to the *Career Transitions Guide to Standards and Implementation*, Section B: Strand Rationale and Philosophy.

The Career Transitions strand provides extensive opportunities for career preparation through its themes on Career Readiness, Leadership, Career Extensions, Career Credentials and Job Safety Skills.

Of particular relevance to career planning and preparation at the high school level are the following courses in the Career Readiness theme:

- CTR1010: Job Preparation
- CTR2010: Job Maintenance
- CTR3010: Preparing for Change.

Courses can be designed that prepare students for particular career fields by combining one or more courses from the Career Transitions strand with intermediate- and advanced-level courses from other strands having a business/industry focus.

## EMPLOYABILITY SKILLS

Refer to the *CTS Guide to Standards and Implementation*, Section A: Program Rationale and Philosophy.

Career preparation is further enhanced through a set of basic competencies or employability skills integrated throughout all CTS strands and courses. The basic competencies align with critical skills for employability identified by the Conference Board of Canada, and establish standards of performance for:

- managing learning
- managing resources
- problem solving and innovation
- communicating effectively
- working with others
- demonstrating responsibility.

Organized around four developmental stages that address the learning needs of both junior and senior high school students, the basic competencies are included as appropriate in curriculum and assessment standards defined for each CTS course.

## PATHWAYS INTO POST-SECONDARY

Involvement of business/industry, professional associations and post-secondary programs in the development of CTS curriculum has enhanced its relevance and credibility in career contexts. Many students who complete intermediate- and advanced-level courses in one or more CTS strands develop competencies that align with those expected by post-secondary institutions.

Refer to the *CTS Guides to Standards and Implementation*, Section H: Linkages/Transitions.

A summary of post-secondary programs offered at the college, technical and university level, as well as through Apprenticeship and Industry Training, is published periodically in *It's About Time to Start Thinking About Your Future* by Alberta Advanced Education and Career Development and is available for purchase from the LRDC. This information is summarized for each CTS strand through a list of strand-related post-secondary programs.

### RECOGNITION OF PRIOR LEARNING

Prior learning in CTS may be recognized at the post-secondary level in a variety of ways, including:

- recommended learning
- preferred entrance
- prerequisite to entry
- time credit
- partial credit
- advanced placement.

Refer to:
- *CTS Guide to Standards and Implementation*, Section H: Linkages/Transitions
- CTS at the Alberta Education web site under "What's New and Upcoming Events?".

While agreements with post-secondary institutions vary in terms of how prior learning in CTS is recognized, most provide preferred entrance, advanced placement and/or advanced standing for CTS students who have successfully completed designated courses or course sequences. Schools and school systems are encouraged to contact local post-secondary institutions regarding:

- the status of existing articulation agreements established at the provincial level
- other ways of having locally designed CTS courses recognized by post-secondary institutions.

Schools and teachers may decide to work with local post-secondary institutions in establishing a basis for recognizing prior learning in locally designed CTS courses.

Advanced level courses are accepted in lieu of 30-level practical arts courses in qualifying for post-secondary entrance.

## APPRENTICESHIP ARTICULATION AGREEMENTS

Articulation agreements have been established between CTS strands and a number of the Alberta Apprenticeship Training Programs. Through these agreements, students who complete required CTS courses and successfully challenge appropriate theory and practical examinations for particular trades may qualify for:

- a portion of the trade's in-school training program, and/or
- on-the-job time credit within the trade.

The following chart summarizes apprenticeship articulation agreements currently in place.

| *Apprenticeship Trade* | *Length of Program* | *Number of Required CTS Courses* | *Credit for Formal Training* | *On-the-Job Time Credit* |
|---|---|---|---|---|
| Automotive Service Technician | 4 yrs | 25<br>35 | 1st Period<br>1st & 2nd Period | Nil<br>525 hrs |
| Carpenter | 4 yrs | 25 | 1st Period | Nil |
| Cook | 3 yrs | 17<br>30 | 1st Period<br>1st & 2nd Period | Nil<br>450 hrs |
| Hairstylist | 2 yrs | 35<br>55 | 1st Period<br>1st & 2nd Period | 525 hrs<br>700 hrs |
| Welder | 3 yrs | 25 | 1st Period | Nil |

Refer to Attachment 2: Apprenticeship Articulation Agreements.

Further details regarding each articulation agreement—including correlations to CTS strands and courses—are provided as an attachment to this document.

Refer to Attachment 4: Directory of Apprenticeship and Credentialling Contacts.

Additional information can be obtained by contacting Alberta Advanced Education and Career Development, Apprenticeship and Industry Training Division. A list of local Career Development Centres throughout Alberta is also provided as an attachment.

Current information regarding the status of articulation agreements with Alberta's apprenticeship trades is available on the Alberta Education web site at <http://ednet.edc.gov.ab.ca/cts>.

## CREDENTIALLING FOR THE WORKPLACE

CTS students may earn partial or complete credentials recognized in the workplace and/or by post-secondary institutions through their work in particular CTS strands and courses. Credentials enhance the credibility of learning by providing written evidence of a student's qualifications with respect to competencies established by agencies external to the school.

Refer to Attachment 3: Credentialling Opportunities in CTS Strands.

Students can earn credentials by successfully meeting the curriculum and assessment standards established for:

- specific credential-bearing courses
- generic "practicum" courses from the Career Transitions strand that incorporate learnings requisite to particular credentials.

Refer to the *CTS Guide to Standards and Implementation*, Section H: Linkages/Transitions.

Each CTS strand provides information regarding relevant credentialling opportunities. Schools can use this information as a basis for further research and planning regarding credentials that may be viable in their community. Teachers are encouraged to plan courses that incorporate these learning opportunities when appropriate.

## OFF-CAMPUS LEARNING

A variety of off-campus learning experiences are suggested throughout the CTS curriculum—work study, work experience, job shadowing, mentorship. Each provides valuable opportunities for both students and schools to enhance connections with business/industry, professional associations, post-secondary institutions and/or other community groups.

### WORK EXPERIENCE PROGRAM

Refer to:
- *Off-campus Education Policy*, 1997
- *Off-campus Education Guide for Administrators, Counsellors & Teachers*, 1995.

The Work Experience program is designed to extend the boundaries of learning beyond the school into the community through education–business partnerships. Work Experience courses are delivered off-campus under the supervision of a community partner, and enable students to develop:

- an understanding of expectations in the workplace
- knowledge and skills relevant to a specific career.

Students can spend from 75 to 250 hours in Work Experience courses in each of Grades 10, 11 and 12. Although Work Experience and CTS are different programs, CTR1010: Job Preparation is a prerequisite for all Work Experience courses.

Schools may choose to register students concurrently in both CTS and Work Experience courses.

## REGISTERED APPRENTICESHIP PROGRAM

The Registered Apprenticeship Program (RAP) is designed for high school students who wish to begin a trade apprenticeship while completing their high school diploma. A RAP apprentice accumulates hours of on-the-job training as credit toward both a journeyman certificate and a high school diploma. After graduating from high school a RAP apprentice can become a full-time apprentice.

Refer to the *Registered Apprenticeship Program Information Booklet*, April 1997.

RAP 15–25–35 courses are taught through off-campus learning under the joint supervision of a certified teacher and a journeyman in the workplace. The hours of work are flexible, determined by the employer, the student and the school. Some options are:

- working as a RAP apprentice for one school semester, and going to school during the other semester
- working as a RAP apprentice for a half day, and attending school for the other half day
- working as a RAP apprentice during the summer months, holidays and weekends, and attending school during the regular school term
- working as a RAP apprentice one or two days a week, and attending school on the other days.

Although RAP and CTS are separate programs, courses in each may complement one another. Students can enroll in both RAP courses and trade-related CTS courses in the same school year providing the RAP learning plan identifies new learnings substantially different from those included in the CTS courses that require access to 125 hours of on-the-job training.

## Overview of the National Occupational Classification

The National Occupational Classification (NOC): Occupational Descriptions, Employment and Immigration Canada, Minister of Supply and Service Canada, 1993, provides a systematic taxonomy of occupations in the Canadian labour market. The NOC system is based on skill level and skill type criteria.

| SKILL LEVEL CRITERIA | | |
|---|---|---|
| **SKILL LEVEL** | **EDUCATION/TRAINING** | **OTHER** |
| **SKILL LEVEL A** | • University degree (bachelor's, master's, or post-graduate | |
| **SKILL LEVEL B** | • Two to three years of post-secondary education at community college , institute of technology or CEGEP or<br>• Two to four years of apprenticeship training or<br>• Three to four years of secondary school and more than two years of on-the-job training courses or specific work experience | • Occupations with supervisory responsibilities are assigned to skill level B<br>• Occupations with significant health and safety responsibilities (e.g., fire fighters, police officers and registered nursing assistants) are assigned to skill level B |
| **SKILL LEVEL C** | • One to four years of secondary school education<br>• Up to two years of on-the-job training courses or specific work experience | |
| **SKILL LEVEL D** | • Up to two years of secondary school and short work demonstration or on-the-job training | |

| SKILL TYPE CRITERIA | |
|---|---|
| Skill type defines the type of work performed and is represented in NOC by the first number in each of the occupational area's classification. | |
| 0 = Management Occupations<br>1 = Business, Finance and Administration<br>2 = National and Applied Sciences and Related Occupations<br>3 = Health Occupations<br>4 = Occupations in Social Sciences, Education, Government Service and Religion | 5 = Occupations in Art, Culture, Recreation and Sport<br>6 = Sales and Service<br>7 = Trades, Transport and Equipment Operators and Related Occupations<br>8 = Occupations Unique to Primary Industry<br>9 = Occupations Unique to Processing, Manufacturing and Utilities. |

**Refer to the *Guide to Standards and Implementation,* Section H: Linkages/Transitions for a list of occupations in the Canadian labour market related to each CTS strand.**

Attachment 2

## Apprenticeship Articulation Agreements: Automotive Service Technician Trade

**Students who complete required CTS courses identified to the right are eligible to obtain advanced standing in the apprenticeship program for Automotive Service Technician. Based on an articulation agreement established with the Apprenticeship and Industry Training Division, Alberta Advanced Education and Career Development:**

- students who successfully complete 25 required CTS courses related to the Automotive Service Technician trade may be credited, upon successfully challenging the appropriate theory examinations, with the first period of formal instruction. Logged hours earned within the industry toward the trade may also be credited upon the recommendation of the employer
- students who successfully complete 35 required CTS courses related to the Automotive Service Technician trade may be credited, upon successfully challenging the appropriate theory examinations, with the first and second periods of formal instruction and 525 hours of on-the-job training (375 hours for the first period and 150 hours for the second period). Additional logged hours earned within the industry toward the trade may also be credited upon the recommendation of the employer.

**Additional terms of the agreement require that:**

- required CTS courses identified with a ■ must be delivered and assessed by a journeyman automotive service technician
- teachers responsible for the program must verify the successful completion of all required courses.

Student: ____________________
Supervising Teacher: ____________________
School: ____________________
School Telephone: ____________________
Principal's Signature: ____________________

Number of Courses Successfully Completed:
- First Period ______ • Second Period ______

Date Issued: ____________________
Journeyman Instructor's Signature: ____________________
Journeyman Certificate No.: ____________________

**Required CTS Courses in Mechanics and Related Strands★**

| Completed Courses ✓ | Course Code | Course Name |
|---|---|---|
| FIRST PERIOD | | |
| | MEC1020 | Vehicle Service & Care |
| | MEC1040 | Engine Fundamentals |
| | MEC1090 | Electrical Fundamentals |
| | MEC1110 | Pneumatics & Hydraulics |
| | MEC1130 | Mechanical Systems |
| | MEC1150 | Ride & Control Systems |
| | MEC1160 | Structures & Materials |
| | FAB1040 | Oxyacetylene Welding |
| | FAB1130 | Principles of Machining |
| | MEC2020 | Vehicle Maintenance■ |
| | MEC2030 | Lubrication & Cooling■ |
| | MEC2060 | Ignition Systems■ |
| | MEC2090 | Electrical Components■ |
| | MEC2100 | Power Assist Accessories■ |
| | MEC2110 | Braking Systems■ |
| | MEC2120 | Hydraulic Accessories■ |
| | CTR2110 | Project A (Brake Project)■ |
| | MEC2130 | Drive Trains■ |
| | CTR2120 | Project 2B (Electrical Project)■ |
| | MEC2150 | Suspension Systems■ |
| | MEC2160 | Steering Systems■ |
| | MEC3040 | Engine Tune-up■ |
| | MEC3100 | Safety Systems■ |
| | MEC3150 | Wheel Alignment■ |
| | CTR3120 | Project 3B (Wheel Alignment Project)■ |
| SECOND PERIOD | | |
| | MEC2040 | Fuel & Exhaust Systems■ |
| | MEC2050 | Alternative Fuel Engines■ |
| | MEC2070 | Emission Controls■ |
| | MEC3030 | Engine Diagnosis■ |
| | MEC3050 | Engine Replacement■ |
| | MEC3060 | Engine Reconditioning 1■ |
| | MEC3070 | Engine Reconditioning 2■ |
| | CTR3130 | Project 3C (Engine Components Project)■ |
| | MEC3140 | Drive Train Repair■ |
| | CTR3140 | Rear Axle and Differential Project■ |

■ Courses that must be delivered and assessed by a journeyman automotive service technician.

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★ For a detailed description of CTS courses, see the appropriate *Guide to Standards and Implementation* available for purchase from the Learning Resources Distributing Centre, or for viewing and downloading from the Alberta Education web site at <http://ednet.edc.gov.ab.ca/cts>.

## ★APPRENTICESHIP ARTICULATION AGREEMENTS: Carpenter Trade

**Students who complete required CTS courses identified to the right are eligible to obtain advanced standing in the apprenticeship program for Carpenter. Based on an articulation agreement established with the Apprenticeship and Industry Training Division, Alberta Advanced Education and Career Development:**

- students who successfully complete 25 required CTS courses related to the Carpenter trade may be credited, upon successfully challenging the appropriate theory and practical examinations, with the first period of formal instruction. Logged hours earned within the industry toward the trade may also be credited upon the recommendation of the employer

**Additional terms of the agreement require that:**

- required CTS courses identified with a ■ must be delivered and assessed by a journeyman carpenter
- teachers responsible for the program must verify the successful completion of all required courses.

**Required CTS Courses in Construction Technologies and Related Strands★**

| Completed Courses ✓ | Course Code | Course Name |
|---|---|---|
| FIRST PERIOD | | |
| | CON1010 | Basic Tools & Materials |
| | CON1070 | Building Construction |
| | DES1010 | Sketch, Draw & Model |
| | CON1120 | Project Management |
| | CON1130 | Solid Stock Construction |
| | CON1160 | Manufactured Materials |
| | CON2120 | Multiple Materials |
| | CON2130 | Furniture Making 1 (Box Construction)■ |
| | CON2160 | Cabinetmaking 1 (Web & Face Frame)■ |
| | CON2170 | Cabinetmaking 2 (Door & Drawer)■ |
| | FAB2010 | Structural Engineering |
| | FAB2020 | Print Reading |
| | CON2010 | Site Preparation■ |
| | CON2020 | Concrete Forming■ |
| | CTR2110 | Project 2A (Concrete Forming and Placing)■ |
| | CON2040 | Framing Systems 1 (Floor & Wall)■ |
| | CON2050 | Roof Structures 1 (Framing & Finishing)■ |
| | CON3080 | Energy-efficient Housing■ |
| | CON3010 | Concrete Work (Structures & Finishes)■ |
| | CON3100 | Commercial Structures■ |
| | CON3110 | Site Management■ |
| | CON3120 | Tool Maintenance■ |
| | CTR2120 | Project 2B (Practical Work)■ |
| | CTR3110 | Project 3A (Practical Work)■ |
| | CTR3040 | Practicum A (Explosive Actuated Tools)■ |

■ Courses that must be delivered and assessed by a journeyman carpenter.

Student: ______________________________

Supervising Teacher: ____________________

School: _______________________________

School Telephone: ______________________

Principal's Signature: ___________________

Number of Courses Successfully Completed:

- First Period _____

Date Issued: ___________________________

Journeyman Instructor's Signature: __________

Journeyman Certificate No.: ______________

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★For a detailed description of CTS courses, see the appropriate *Guide to Standards and Implementation* available for purchase from the Learning Resources Distributing Centre, or for viewing and downloading from the Alberta Education web site at <http://ednet.edc.gov.ab.ca/cts>.

**Attachment 2** (continued)

## Apprenticeship Articulation Agreements: Cook Trade

**Students who complete required CTS courses identified to the right are eligible to obtain advanced standing in the apprenticeship program for Cook. Based on an articulation agreement established with the Apprenticeship and Industry Training Division, Alberta Advanced Education and Career Development:**

- students who successfully complete 17 required CTS courses related to the Cook trade may be credited, upon successfully challenging the appropriate theory examinations, with the first period of formal instruction. Paid hours earned within the industry toward the trade may also be credited upon the recommendation of the employer
- students who successfully complete 30 required CTS courses related to the Cook trade may be credited, upon successfully challenging the appropriate theory examinations, with the first and second periods of formal instruction and 450 hours of on-the-job training. Additional logged hours earned within the industry toward the trade may also be credited upon the recommendation of the employer.

**Additional terms of the agreement require that:**

- all required CTS courses must be delivered and assessed by a journeyman cook
- in order to challenge the first period examination, candidates must possess a Food Safe Provincial Certificate
- teachers responsible for the program must verify the successful completion of all required courses.

Student: ______________________________

Supervising Teacher: ______________________

School: ______________________________

School Telephone: ________________________

Principal's Signature: ______________________

Number of Courses Successfully Completed:

- First Period ______ • Second Period ______

Date Issued: ____________________________

Journeyman Instructor's Signature: ____________

Journeyman Certificate No.: _________________

**Required CTS Courses in Foods and Related Strands★**

| Completed Courses ✓ | Course Code | Course Name |
|---|---|---|
| | **FIRST PERIOD** | |
| | FOD1010 | Food Basics |
| | FOD1020 | Baking Basics |
| | FOD1050 | Fast & Convenience Foods |
| | FOD1060 | Canadian Heritage Foods |
| | FOD2010 | Food & Nutrition Basics |
| | FOD2040 | Cake & Pastry |
| | FOD2050 | Yeast Breads & Rolls |
| | FOD2060 | Milk Products & Eggs |
| | FOD2070 | Stocks, Soups & Sauces |
| | FOD2080 | Vegetables/Fruits/Grains |
| | FOD2090 | Creative Cold Foods |
| | FOD2100 | Basic Meat Cookery |
| | FOD2110 | Fish & Poultry |
| | FOD2130 | Vegetarian Cuisine |
| | FOD2150 | Food Safety & Sanitation◆ |
| | FOD2170 | International Cuisine 1 |
| | FOD3090 | Basic Meat Cutting |
| | **SECOND PERIOD** | |
| | CTR2110 | Project 2A (Canadian Heritage Foods) |
| | CTR2120 | Project 2B (Food & Nutrition Basics) |
| | CTR3110 | Project 3A (Vegetables/Fruits/Grains) |
| | CTR3120 | Project 3B (Fish & Poultry) |
| | FOD3030 | Creative Baking |
| | FOD3040 | Advanced Yeast Products |
| | FOD3050 | Advanced Soups & Sauces |
| | FOD3060 | Food Presentation |
| | FOD3070 | Short Order Cooking |
| | FOD3080 | Advanced Meat Cookery |
| | FOD3100 | Entertaining with Food |
| | FOD3110 | Food Processing |
| | FOD3140 | International Cuisine 2 |

◆ Certification requirement.

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★ For a detailed description of CTS courses, see the appropriate *Guide to Standards and Implementation* available for purchase from the Learning Resources Distributing Centre, or for viewing and downloading from the Alberta Education web site at <http://ednet.edc.gov.ab.ca/cts/>.

## Apprenticeship Articulation Agreements: Hairstylist Trade

**Students who complete required CTS courses identified to the right are eligible to obtain advanced standing in the apprenticeship program for Hairstylist. Based on an agreement established with the Apprenticeship and Industry Training Division, Alberta Advanced Education and Career Development:**

- students who successfully complete 35 required CTS courses related to the Hairstylist trade may be credited, upon successfully challenging the appropriate theory examinations, with the first period of formal instruction and 525 hours of on-the-job training credits toward the first period of apprenticeship
- students who successfully complete 55 required CTS courses related to the Hairstylist trade may be credited, upon successfully challenging the appropriate theory and practical examinations, with the first and second periods of formal instruction and 700 hours of on-the-job training credits toward the first period of apprenticeship.

**Additional terms of the agreement require that:**

- instruction be provided in accordance with the journeyman certification requirements defined for each course in the course parameters section of the appropriate CTS *Guide to Standards and Implementation*
- teachers responsible for the program must verify the successful completion of all required courses.

Student: ______________________________
Supervising Teacher: ____________________
School: ______________________________
School Telephone: ______________________
Principal's Signature: _________________ ____

Number of Courses Successfully Completed:
• First Period _______ • Second Period ______
Date Issued: ___________________________
Journeyman Instructor's Signature: ___________
Journeyman Certificate No.: _______________

**Required CTS Courses in Cosmetology Studies and Related Strands★**

| Completed Courses ✓ | Course Code | Course Name |
|---|---|---|
| | COS1010◆ | Personal Images |
| | COS1020◆ | Hair Graphics 1 |
| | COS1030◆ | Hair & Scalp Care 1 |
| | COS1040◆ | Forming & Finishing 1 |
| | COS1050◆ | Permanent Waving 1 (The Physical Process) |
| | COS1060◆ | Skin Care 1 (Basic Practices) |
| | COS1070◆ | Manicuring 1 |
| | COS2010◆ | Hair Graphics 2 |
| | COS2020◆ | Hair & Scalp Care 2 |
| | COS2030◆ | Forming & Finishing 2 |
| | COS2040◆ | Haircutting 1 |
| | COS2050◆ | Hair Care & Cutting 1 (Client Services) |
| | COS2060◆ | Permanent Waving 2 (Cold Waving) |
| | COS2070◆ | Permanent Waving 3 (Heat-assisted) |
| | COS2080◆ | Permanent Waving 4 (Client Services) |
| | COS2090◆ | Colouring 1 |
| | COS2100 | Colour Removal 1 |
| | COS2110 | Colouring & Removal 1 (Client Services) |
| | COS2120◆ | Facials & Makeup 1 |
| | COS2130◆ | Facials & Makeup 2 (Client Services) |
| | COS2140 | Skin Care 2 (Client Services) |
| | COS2150◆ | Manicuring 2 |
| | COS2170◆ | Manicuring 3 (Client Services) |
| | COS2180◆ | Hairpieces & Extensions |
| | COS2210◆ | Sales & Service 1 (Principles & Practices) |
| | DES1020◆ | The Design Process |
| | COS3010◆ | Professional Practices |
| | COS3020◆ | Long Hair Graphics |
| | COS3030◆ | Hair & Scalp Care 3 |
| | COS3040◆ | Hair & Scalp Care 4 (Client Services) |
| | COS3050◆ | Haircutting 2 |
| | COS3060◆ | Haircutting 3 (Client Services) |
| | COS3070◆ | Hair Care & Cutting 2 (Client Services) |
| | COS3080 | Permanent Waving 5 (Designer) |
| | COS3090◆ | Relax/Straighten Hair |
| | COS3100◆ | Wave, Relax & Straighten Hair (Client Services) |
| | COS3110◆ | Colouring 2 (Permanent) |
| | COS3120 | Colour Removal 2 |
| | COS3130 | Colouring & Removal 2 (Client Services) |
| | COS3140 | Body Therapy |
| | COS3150 | Hair Removal |
| | COS3160 | Skin Care 3 (Client Services) |
| | COS3170◆ | Male Facial Grooming 1 |
| | COS3180 | Male Facial Grooming 2 (Client Services) |
| | COS3190 | Nail Technology |
| | COS3200 | Pedicuring |
| | COS3220 | Wigs & Toupees |
| | COS3230 | Hair Goods (Client Services) |
| | COS3260 | Facial & Body Adornment |
| | COS3270 | Creative Cosmetology |
| | ENT1010◆ | Challenge & Opportunity |
| | ENT1020 | Planning a Venture |
| | ENT2010 | Analyzing Ventures |
| | ENT2040 | Implementing the Venture |
| | ENT3010 | Managing the Venture |

◆ Indicates the 35 required courses for credit toward first period training; all of the 55 required courses identified above must be completed for credit toward first and second period training.

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★ For a detailed description of CTS courses, see the appropriate *Guide to Standards and Implementation* available for purchase from the Learning Resources Distributing Centre, or for viewing and downloading from the Alberta Education web site at <http://ednet.edc.gov.ab.ca/cts/>.

## Apprenticeship Articulation Agreements: Welder Trade

**Students who complete required CTS courses identified to the right are eligible to obtain advanced standing in the apprenticeship program for Welder. Based on an agreement established with the Apprenticeship and Industry Training Division, Alberta Advanced Education and Career Development:**

- students who successfully complete 25 required CTS courses related to the Welder trade may be credited, upon successfully challenging the appropriate theory and practical examinations, with the first period of formal instruction. Logged hours earned within the industry toward the trade may also be credited upon the recommendation of the employer

**Additional terms of the agreement require that:**

- required CTS courses identified with a ■ must be delivered and assessed by a journeyman automotive service technician
- teachers responsible for the program must verify the successful completion of all required courses.

Student: ______________________________

Supervising Teacher: ______________________

School: _______________________________

School Telephone: ________________________

Principal's Signature: ______________________

Number of Courses Successfully Completed:

- First Period ______ • Second Period ______

Date Issued: ____________________________

Journeyman Instructor's Signature: ___________

Journeyman Certificate No.: _________________

**Required CTS Courses in Fabrication Studies and Related Strands★**

| Completed Courses ✓ | Course Code | Course Name |
|---|---|---|
| | **FIRST PERIOD** | |
| | CON1010 | Basic Tools & Materials |
| | FAB1040 | Oxyacetylene Welding |
| | FAB1050 | Basic Electric Welding |
| | FAB1110 | Bar & Tubular Fabrication |
| | FAB1100 | Fabrication Principles |
| | FAB2020 | Print Reading |
| | FAB2030 | Oxyfuel Welding ■ |
| | FAB2040 | Thermal Cutting ■ |
| | FAB2050 | Arc Welding 1 ■ |
| | FAB2060 | Arc Welding 2 ■ |
| | FAB2070 | Gas Metal Arc Welding 1 ■ |
| | FAB2160 | Custom Fabrication ■ |
| | CTR2110 | Project 2A (Practical Work) ■ |
| | CTR2120 | Project 2B (Practical Work) ■ |
| | FAB3020 | Metallurgy Fundamentals |
| | FAB3050 | Arc Welding 3 ■ |
| | FAB3060 | Arc Welding 4 ■ |
| | FAB3170 | Gas Metal Arc Welding 2 ■ |
| | FAB3070 | Pipe & Tubular Welding ■ |
| | FAB3040 | Specialized Welding ■ |
| | FAB3160 | Prefabrication Principles ■ |
| | CTR3110 | Project 3A (Practical Work) ■ |
| | CTR3120 | Project 3B (Practical Work) ■ |
| | DES1010 | Sketch, Draw & Model |
| | DES2040 | Drafting/Design Applications |

■ Courses that must be delivered and assessed by a journeyman welder.

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★ For a detailed description of CTS courses, see the appropriate *Guide to Standards and Implementation* available for purchase from the Learning Resources Distributing Centre, or for viewing and downloading from the Alberta Education web site at <http://ednet.edc.gov.ab.ca/cts>.

Attachment 3

## Credentialling Opportunities in CTS Strands

| | CTS Strand | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Credential** | Agriculture | Career Transitions | Community Health | Construction Technologies | Energy and Mines | Foods | Forestry | Tourism Studies | Wildlife |
| Alberta Conservation and Hunter Education Program | | | | | | | | | x |
| Alberta Fishing Education Program | | | | | | | | | x |
| Alberta Tourism Industry Standards: Outdoor Guide | | | | | | | | | x |
| Athletic First Aid | | | x | | | | | | |
| Babysitting | | | x | | | | | | |
| Canadian Firearms Safety Course | | x | | | | | | | |
| CPR Level C | | x | x | | | | | | |
| Child Care First Aid | | | x | | | | | | |
| Day Care Level 1 | | | x | | | | | | |
| Emergency Child Care | | | x | | | | | | |
| Explosive Actuated Tools | | | | x | | | | | |
| Family Health Care | | | x | | | | | | |
| Farm Pesticide Certificate Program | | x | | | | | | | |
| First-Aid Certification: Advanced First Aid Level II | | x | | | x | | | | |
| First-Aid Certification: Child Care | | | x | | | | | | |
| First-Aid Certification: Emergency First Aid | | x | | | | | | | |
| First-Aid Certification: Standard First Aid | | | x | | | | | | |
| First-Aid Certification: First-Aid in the Wilderness | | x | | | | | | | |
| Green Certificate Training Program | x | | | | | | | | |
| Job Safety Skills | | x | | | | | | | |
| Lawn and Garden Domestic Pesticide Dispenser Course | | x | | | | | | | |
| Oxygen Administration | | x | x | | | | | | |
| Pesticide Applicator Certificate | | x | | | | | | | |
| Petroleum Industry Training Program | | | | | x | | | | |
| Power Engineering Technology | | x | | | | | | | |
| Safe Food Handler | | | | | | x | | | |
| Tourism: Alberta Best | | | | | | | | x | |
| Transportation of Dangerous Goods (TDG) | | x | | | | | | | |
| Workplace Hazardous Materials Information System (WHMIS) | | x | | | | | | | |

## AGRICULTURE

| Certificate | Agency | Courses | Instructor Qualifications | Comments |
|---|---|---|---|---|
| Farmer Pesticide Certificate Program | Extension Services, Olds College | CTR Practicum Modules A–E (CTR3040–3080) | Yes—with Olds College | |
| Green Certificate Training Program<br>• Beef Production<br>• Dairy Production<br>• Crop Production<br>• Irrigated Crop Production<br>• Sheep Production<br>• Swine Production | Alberta Agriculture, Food and Rural Development | Field Crops 1 (Materials & Processes) (AGR2030)<br>Field Crops 2 (Management Techniques) (AGR3030)<br>Livestock/Poultry 1 (Materials & Processes) (AGR2040)<br>Livestock/Poultry 2 (Management Techniques) (AGR3040) | None—final evaluation by Green Certificate personnel, Alberta Agriculture, Food and Rural Development | |
| Lawn and Garden Domestic Pesticide Dispenser Course | Extension Services, Olds College | CTR Practicum Modules A–E (CTR3040–3080) | Yes—with Olds College | |
| Pesticide Applicator Certificate<br>• Agriculture<br>• Landscape<br>• Industrial | Continuing Education, Lakeland College | CTR Practicum Modules A–E (CTR3040–3080) | None | Certification available upon successful completion of extension course and final examination |

## CAREER TRANSITIONS

| Certificate | Agency | Courses | Instructor Qualifications | Comments |
|---|---|---|---|---|
| Job Safety Skills | Job Safety Skills Society | Personal Safety (Management) (CTR1210)<br>Workplace Safety (Practices) (CTR2210)<br>Safety Management Systems (CTR3210) | Variable (e.g., First-Aid, WHMIS) | |
| Emergency First-Aid | St. John Ambulance<br>The Canadian Red Cross Society | Personal Safety (Management) (CTR1210) | Certified First-Aid/ CPR Instructor | See *Community Health* |

## COMMUNITY HEALTH

| Certificate | Agency | Courses | Instructor Qualifications | Comments |
|---|---|---|---|---|
| Babysitting | St. John Ambulance<br>The Canadian Red Cross Society | Caring for Children (CMH1040) | None—but Standard First-Aid Certificate is recommended | Includes artificial respiration, treatment for burns, poisoning, wounds, bleeding and baby care techniques |
| Emergency Child Care<br>First-Aid in Child Care<br>Child Care First Aid | St. John Ambulance<br>The Canadian Red Cross Society | First Aid/CPR for Children (CMH3120) | Certified First-Aid/ CPR Instructor with a Child Care Instructor designation | Three-year nationally recognized certificate designed for child care workers; recognized by Alberta Family and Social Services |
| Emergency First-Aid | St. John Ambulance<br>The Canadian Red Cross Society | Personal Safety (Management) (CTR1210) | Certified First-Aid/ CPR Instructor | Three-year nationally recognized certificate; includes artificial respiration, treatment for choking, bleeding, shock and one rescuer CPR |
| Standard First-Aid | St. John Ambulance<br>The Canadian Red Cross Society | First Aid/CPR (CMH2120) | Certified First-Aid/ CPR Instructor | Three-year nationally recognized certificate; includes Emergency First Aid, plus treatment of bone and joint injuries, heat, cold emergencies, medical conditions |
| Family Health Care | St. John Ambulance | Home Care 1 (CMH1060)<br>Home Care 2 (Personal Care Services) (CMH2060)<br>Home Care 3 (Special Conditions) (CMH3060) | None | Under revisions |
| Day Care Level I | Alberta Family and Social Services | Day Care 1 and 2 (CMH2050, 3050) plus 2 CTR practicum modules | None | The minimum qualification required by day care workers in Alberta; recognized by Alberta Family and Social Services; must be 16 years of age |
| Athletic First-Aid | Alberta Sports Medicine Council | Sports First Aid 1 (CMH2130) | None | Emphasis on prevention of sports injuries; includes caring for sports injuries and basic taping techniques |
| Advanced First-Aid Level II (100 hours) | St. John Ambulance | CTR Practicum Modules A–E (CTR3040–3080) | Certified First-Aid Instructor Advanced II | Includes oxygen administration, extended first aid and accident scene management |

| Certificate | Agency | Courses | Instructor Qualifications | Comments |
|---|---|---|---|---|
| Oxygen Administration (10 hours) | St. John Ambulance | CTR Practicum Modules A–E (CTR3040–3080) | Certified Oxygen Administration Instructor | Includes supplemental oxygen in emergencies, treatment of hypoxia and safety measures in handling oxygen |
| CPR Level C (12 hours) | The Canadian Red Cross Society<br>St. John Ambulance | CTR Practicum Modules A–E (CTR3040–3080) | CPR Instructors | Nationally recognized certification; includes airway management and CPR for adults, child, infants and 2-rescuer adult CPR |

## CONSTRUCTION TECHNOLOGIES

| Certificate | Agency | Courses | Instructor Qualifications | Comments |
|---|---|---|---|---|
| Explosive Actuated Tools | Technical Institute or College (post-secondary) | Concrete Work (Structures & Finishes) (CON3010) | EAT certificate | Required by Occupational Health and Safety for all operators to be certified; informal credentialling can be arranged through local post-secondary |

## ENERGY AND MINES

| Certificate | Agency | Courses | Instructor Qualifications | Comments |
|---|---|---|---|---|
| First-Aid Certification<br>• Emergency First-Aid | St. John Ambulance<br>The Canadian Red Cross Society | First Aid/CPR (CMH2120) | Yes—see *Community Health* | |
| First-Aid Certification<br>• Standard First-Aid<br>• Advanced First-Aid | St. John Ambulance<br>The Canadian Red Cross Society | First Aid/CPR (CMH2120) | Yes—see *Community Health* | Three-year certificates recognized by Occupational Health and Safety; see Community Health strand for details |
| Petroleum Industry Training Programs<br>• Petroleum Fundamentals<br>• Hydrogen Sulphide Alive<br>• Blowout Prevention<br>• Floorman Training<br>• Oilfield Maintenance | Petroleum Industry Training Service (PITS) | Conventional Oil/ Gas 1 (Resource Exploration) (ENM2020)<br>Conventional Oil/ Gas 2 (Recovery & Production) (ENM3020)<br>Supply & Distribution (ENM2080)<br>Environmental Safety (ENM2100) | Yes—certified instructors from industry | Representative training programs that address standards accepted by industry and relevant regulatory agencies |

| | | | | |
|---|---|---|---|---|
| Workplace Hazardous Materials Information System (WHMIS) | Occupational Health and Safety | Personal Safety (Management) (CTR1210) | Yes—see *Career Transitions* | Addresses skills required to work safely around hazardous materials |
| Transportation of Dangerous Goods (TDG) | Occupational Health and Safety | Workplace Safety (Practices) (CTR2210) | Yes—see *Career Transitions* | Addresses skills required for the transportation and handling of dangerous goods |
| Power Engineering Technology | Power Engineering Department, SAIT | CTR Practicum Modules A–E (CTR3040–3080) | Yes—certified instructor from industry | Links with Third Class Power Engineering |

## FOODS

| Certificate | Agency | Courses | Instructor Qualifications | Comments |
|---|---|---|---|---|
| Food Sanitation and Hygiene | Alberta Health, Environmental Health Services | Food Safety & Sanitation (FOD2150) | | |

## FORESTRY

| Certificate | Agency | Courses | Instructor Qualifications | Comments |
|---|---|---|---|---|
| Alberta Conservation and Hunter Education Program | Alberta Environmental Protection, Fish and Wildlife Services | Hunting & Game Management 1 (Ethics/Game Identification) (WLD1070)<br>Hunting & Game Management 2 (Field Techniques/ Regulations) (WLD2070) | Yes—with Alberta Environmental Protection | Contact Alberta Environmental Protection, Fish and Wildlife Services for information regarding instructor and student certification |
| Alberta Fishing Education Program | Alberta Environmental Protection, Fish and Wildlife Services | Angling & Fish Management (WLD1080) | Yes—with Alberta Environmental Protection | |
| Alberta Tourism Industry Standards—Outdoor Guide | Alberta Tourism Education Council (ATEC) | Outdoor Experiences 1 (Survival Skills) (WLD1030)<br>Outdoor Experiences 2 (Wilderness Excursion) (WLD2030) | None | Industry standards currently available—certification under development. Evaluation by industry peer-based or written examination and demonstration of practical skills |

**Attachment 3** (continued)

| | | | | |
|---|---|---|---|---|
| Canadian Firearms Safety Course | Alberta Justice, Chief Provincial Firearms Office | CTR Practicum Modules A–E (CTR3040–3080) | Yes—with Alberta Justice | Contact Alberta Justice for information regarding instructor and student certification |
| Emergency First-Aid | St. John Ambulance<br>The Canadian Red Cross Society | Personal Safety (Management) (CTR1210) | Yes | See *Community Health* and/or *Career Transitions* |
| Standard First-Aid | St. John Ambulance<br>The Canadian Red Cross Society | First Aid/CPR (CMH2120) | Yes | |
| First Aid in the Wilderness | St. John Ambulance | CTR Practicum Modules A–E (CTR3040–3080) | Yes—with St. John Ambulance | Evaluation done by instructor certified with St. John Ambulance |

## TOURISM STUDIES

| Certificate | Agency | Courses | Instructor Qualifications | Comments |
|---|---|---|---|---|
| Tourism: Alberta Best | Alberta Tourism Education Council | Quality Guest Service (TOU1030) | Alberta Best Trainers | No renewal time frame |

## WILDLIFE

| Certificate | Agency | Courses | Instructor Qualifications | Comments |
|---|---|---|---|---|
| Alberta Conservation and Hunter Education Program | Alberta Environmental Protection, Fish and Wildlife Services | Hunting & Game Management 1 (Ethics/Game Identification) (WLD1070)<br>Hunting & Game Management 2 (Field Techniques/ Regulations) (WLD2070) | Yes—with Alberta Environmental Protection | Contact Alberta Environmental Protection, Fish and Wildlife Services, for information regarding instructor and student certification |
| Alberta Fishing Education Program | Alberta Environmental Protection, Fish and Wildlife Services | Angling & Fish Management (WLD1080) | Yes—Alberta with Environmental Protection | |
| Alberta Tourism Industry Standards—Outdoor Guide | Alberta Tourism Education Council (ATEC) | Outdoor Experiences 1 (Survival Skills) (WLD1030)<br>Outdoor Experiences 2 (Wilderness Excursion) (WLD2030) | None | Industry standards currently available—certification under development. Evaluation by industry peer-based or written examination and demonstration of practical skills |
| Canadian Firearms Safety Course | Alberta Justice, Chief Provincial Firearms Office | CTR Practicum Modules A–E (CTR3040–3080) | Yes—with Alberta Justice | Contact Alberta Justice for information regarding instructor and student certification |
| Emergency First-Aid | St. John Ambulance<br>The Canadian Red Cross Society | Personal Safety (Management) (CTR1210) | Yes | See *Community Health* and/or *Career Transitions* |
| Standard First-Aid | St. John Ambulance<br>The Canadian Red Cross Society | First Aid/CPR (CMH2120) | Yes | |
| First Aid in the Wilderness | St. John Ambulance | CTR Practicum Modules A–E (CTR3040–3080) | Yes—with St. John Ambulance | Evaluation done by instructor certified with St. John Ambulance |

Attachment 4

# Directory of Apprenticeship and Credentialling Contacts

## Apprenticeship Contacts (Alberta Career Development Centres):

| | | |
|---|---|---|
| Bonnyville Career Development Centre | | 403–826–4175 |
| | Fax | 403–826–1904 |
| Calgary Career Development Centre | | 403–297–5336 |
| | Fax | 403–297–4492 |
| Calgary Canada/Alberta Service Centre | | 403–258–4822 |
| | Fax | 403–258–4719 |
| Edmonton Career Development Centre | | 403–427–8517 |
| | Fax | 403–422–3734 |
| Edmonton Canada/Alberta Service Centre | | 403–438–8111 |
| | Fax | 403–438–8123 |
| Fort McMurray Career Development Centre | | 403–743–7192 |
| | Fax | 403–743–7492 |
| Grande Prairie Career Development Centre | | 403–538–5240 |
| | Fax | 403–538–5237 |
| Hinton Career Development Centre | | 403–865–8293 |
| | Fax | 403–865–8269 |
| Lethbridge/Alberta Service Centre | | 403–381–5380 |
| | Fax | 403–381–5795 |
| Medicine Hat Career Development Centre | | 403–529–3580 |
| | Fax | 403–529–3564 |
| Peace River Career Development Centre | | 403–624–6529 |
| | Fax | 403–624–6476 |
| Red Deer Career Development Centre | | 403–340–5151 |
| | Fax | 403–340–7086 |
| Slave Lake Career Development Centre | | 403–849–7290 |
| | Fax | 403–849–7356 |
| Vermillion Career Development Centre | | 403–853–8150 |
| | Fax | 403–853–8203 |

**Credentialling Contacts (community, government and post-secondary organizations):**

| | | |
|---|---|---|
| Alberta Agriculture Food and Rural Development | | 403–427–2137 |
| Alberta Environmental Protection Fish and Wildlife Services | | 403–944–0313 |
| Alberta Family and Social Services | | 403–427–3734 |
| Alberta Health, Environmental Health Services Area Services Division | | 403–427–2643<br>Fax 403–422–6663 |
| Alberta Justice Chief Provincial Firearms Office | | 403–412–6900 |
| Alberta Sports Medicine Council | | 403–453–8636 |
| Alberta Tourism Education Council (ATEC) | | 1–800–265–1283 |
| Canadian Red Cross | | 1–888–307–7997 |
| Olds College Extension Services | | 403–556–8344 |
| Job Safety Skills Society | | 403–413–6876 |
| Lakeland College Continuing Education | | 403–853–8444 |
| Occupational Health and Safety | | 403–427–8848 |
| Petroleum Industry Training Services (PITS) | Calgary | 403–250–9606 |
| | Nisku | 403–955–7770 |
| SAIT, Power Engineering Department Energy and Natural Resources Department | | 403–284–8284 |
| SAIT Energy and Natural Resources Department | | 403–284–8284 |
| St. John Ambulance | | 1–800–665–7114 |

**Note**: Alberta Government Offices can be reached toll free throughout Alberta by dialing the Alberta Government RITE system at 310–0000 and asking the operator for the department telephone number.